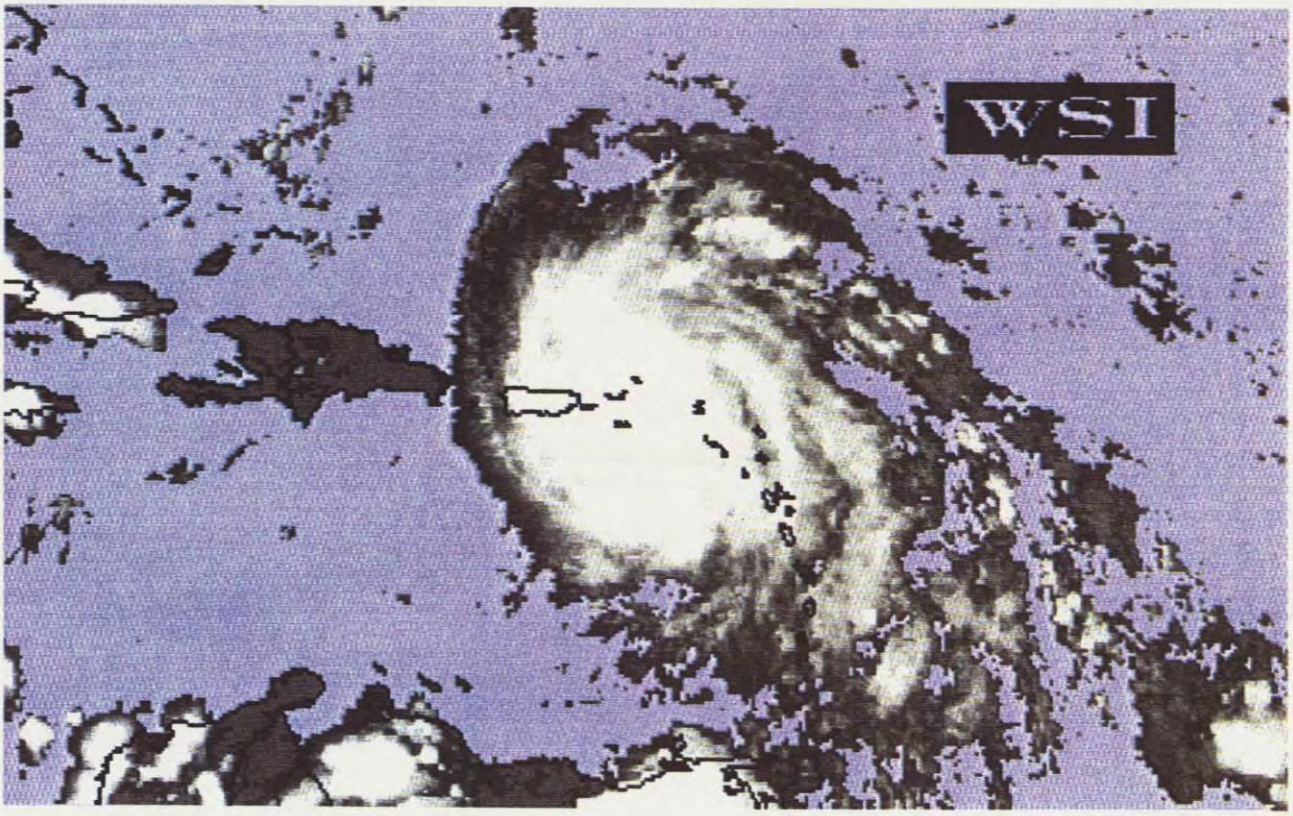
HURRICANE PROCEDURES MANUAL



The CARIBBEAN HOTEL ASSOCIATION

The CARIBBEAN TOURISM ORGANIZATION

ORGANIZATION OF AMERICAN STATES

UNITED STATES AGENCY FOR INT'L DEVELOPMENT

Organization of American States

USAID

1998

The CARIBBEAN HURRICANE EXPERIENCE

Hurricanes are a fact of life in the Caribbean (See Appendix 1). Within the past nine years, from 1988 through 1997, several hurricanes have unleashed their fury on the islands of the Caribbean. Hurricanes David in 1979, Allen in 1980 Gilbert in 1988, Hugo in 1989 and Luis and Marilyn in 1995 caused significant damage to hotels in Dominica, St. Lucia, Jamaica, Montserrat, Antigua, and St. Thomas respectively. Marilyn also caused damage to beaches in Barbados. In 1995 and 1996, thirty-one storms crossed the Caribbean, the Atlantic and the Gulf of Mexico, causing the Regional Mechanism (Caribbean Disaster Response Agency) to be placed on alert nine times over the two years.

The 1995 Hurricane season was the most active, and perhaps the most destructive in recent decades. Hurricane Luis was the most destructive since Hurricane Hugo of 1989, with estimated damages of $2.5 billion occurring in the Caribbean from Luis alone. Following on Luis, Hurricane Bertha affected the region in 1996. Wind damage, storm waves, heavy rains and flooding caused major losses within the tourism sector. In addition, inadequately designed and constructed buildings, damaging media reports and inadequate insurance coverage in some instances have aggravated the financial and social consequences of these events. Recovery for some islands has been slow and some territories have had more than one impact in a single year or in consecutive years.

This hurricane procedures manual, first published in 1990 following Hurricane Hugo, has now been revised to meet the recurring needs of the tourism/hotel sectors for hazard mitigation. Hazard mitigation is defined by the Federal Emergency Management Agency

(FEMA) of the United States as " actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects". This goal can best be achieved by applying various strategies though structural and non-structural measures. Prevention and preparedness planning can help to reduce loss and most importantly will assist speedy resumption of business after the event.

There are some initiatives which need to be taken by the individual hotelier; others require partnerships among hoteliers or between hoteliers and selected stakeholders within the community; and still others require national and even regional collaboration.

This revised edition of the manual includes a chapter on structural vulnerability and loss reduction. One of the most cost-effective measures for mitigating disaster damages is to design and construct hazard resistant structures.

The time to prepare or plan for a hurricane is **before** the Event. The manual therefore, outlines the steps and activities which need to be taken before the hurricane season and certainly before a hurricane threatens. Managing the property and guests **during** an event is crucial to business continuity after the hurricane. Procedures are outlined for all phases of hurricane management. **Immediately following** a strike, there are several critical issues to be dealt with - these are described in the Section entitled **Recovery and Restoration.** Section IV entitled, **Structural Vulnerability and Loss Reduction**, outlines procedures to be followed by the hotelier to assess vulnerability.

The Manual

The manual has been designed to provide recommendations, tasks, and responsibilities for each major department within the facility. It allows for distribution of sections of the plan to the relevant departments, while at the same time allowing for the security and confidentiality of the entire plan. Procedures and responsibility for preparedness, and procedures for vulnerability assessment, appropriate design and retrofitting are outlined.

The prevention and preparedness phase includes: structural and non structural vulnerability assessments, maintenance requirements, retrofitting requirements, emergency supplies, mutual aid agreements, guest information, training, insurance, community liaison, vital records, guest security, weather information, and media communication requirements.

The hurricane phase includes tasks for each department, form hurricane alert to strike. The recovery phase embodies guest relations, damage assessment, impact evaluation, clean-up and salvage, business restoration, and community relations.

The section on structural loss reduction details procedures to be followed for design, maintenance, repair and retrofitting before a hurricane strikes.

Testing, Maintaining, and Upgrading Procedures

This manual is a written document, and not a plan. The procedures detailed must be tested, and the details for each property and department worked out and corrected through training drills and simulation exercises.

Additionally, the procedures must be integrated into the overall management plan for the organization in terms of company policy, operational budget, training, and job descriptions. Training is vital to the success of hurricane preparedness and disaster management and properties should seek to communicate requirements to the respective staff and to implement training programmes for the relevant procedures.

Testing of the Plan Should:

- Confirm that ALL personnel understand their responsibilities and can successfully carry them through.
- Serve as training for personnel.
- Be conducted on an annual basis, preferably before the onset of the hurricane season.
- Include consideration and review of the plan, incorporating changes as these are found necessary.
- Evaluate vulnerability assessments and requirements for maintenance, repair and retrofitting.

Acknowledgment

The revision of this Hurricane Procedures Manual has been a professional pleasure given the increasing exposure of the Caribbean Hotel sector to more intense and frequent hurricane activity within the region. I congratulate the Caribbean Hotel Association (CHA), and the Caribbean Tourism Organization (CTO) for this timely and well needed initiative. Special tribute to the Caribbean Disaster Mitigation Project (CDMP) which joined forces with the CHA and CTO. The CDMP is funded by the Office of Foreign Disaster Assistance (OFDA) of USAID and executed by the Organisation of American States (OAS).

I am grateful to Ms. Kelly Robinson, and Messrs Bill Moore and Alec Sanguinetti of the CHA and Mr Michael Youngman of the CTO for their valuable contribution.

Mr Al Wason, Professional Engineer and Disaster Mitigation Specialist, provided the substantial technical input for the section on Structural Vulnerability and Loss Reduction.

Mr. Joseph Murray of the Murray Group and Mr Luis Flamand of the CHA Insurance Company provided information for the Insurance component and WRH & Associates assisted with design and information for the communications plan.

Mr. Jerry Collymore and Ms. Audrey Mullings of the Caribbean Disaster Response Agency, CDERA, were generous with their reports on hurricane activity for the past 4 years.

Sarah Bell, Lovelette Brooks, and Sharonmae Shirley of Environmental Solutions Limited deserve special thanks for their revised design of the manual.
Grateful thanks to all who have contributed to making this manual a reality.

Eleanor B. Jones
Environmental Solutions Limited
Kingston, Jamaica W.I.

Letter from CHA

Dear Hotelier:

If the primary responsibility of a Trade Association is to respond to the needs of its members, then there could have been few more powerful imperatives than to assist the Hotel & Tourism Industry in dealing with the damage inflicted by hurricanes and other natural disasters in the Caribbean region.

Our sincere thanks must go to the International Hotel Association, whose generous donation from their Fund For the Future started the ball rolling; to American Express Travel related services and USAID/OFDA , who have supported this endeavour by including the chapter on structural loss reduction and picking up the printing bill. With help from CHA's own reserves, and matching support from CTO; this Hurricane Procedures Manual has thus become a reality. Our goal in bringing this project to fruition was to help you better protect the safety of your guests, your property, and certainly to strive to enhance the perpetuation of Caribbean Tourism.

Our thanks also to the professionalism and hard work of Eleanor Jones and Environmental Solutions for making our Manual a reality.

Signed,

John Bell

Executive Vice President

Letter from CTO

Dear Reader:

The Caribbean is blessed with such a glorious and delightful climate most of the time that, were it not for the occasional intrusion of hurricanes, we might be tempted to believe that we have already achieved heaven on earth. However, first Gilbert in 1988, Hugo in 1989, Luis and Marilyn in 1995 and 1996 respectively, are sad reminders that hurricanes do happen in the Caribbean, and that those unfortunate enough to encounter such violent forces of nature in an unprepared state can suffer considerable - and probably unnecessary damage. This Hurricane Preparedness Manual, which CHA and CTO have had prepared, with the technical expertise of Eleanor Jones and Environmental Solutions Ltd., is a timely and useful tool for the tourism sector. However, its real value lies in it being studied, and its action programme being complied with. For both tourism organizations, CHA and CTO, it is the first step in a total programme of education, training, and public relations, in meeting, coping with, and recovering from disasters.

I hope to hear from you readers how you value this document, and I would welcome any ideas on how it might be improved.

Yours Sincerely,

Jean Holder
Secretary General

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Hurricane Characteristics

In preparing for hurricanes, it is important to have some basic knowledge of hurricane characteristics and effects. The short section entitled Hurricane Characteristics provides just that information. The section describes the characteristics of a hurricane, hurricane effects, hurricane categories and the hurricane warning system.

KNOWING IS HALF THE BATTLE

Before a Hurricane

This phase should be ongoing throughout the year. Full preparation is the key to minimizing loss of life and property, and to ensuring speedy resumption of business. All Departments have tasks - but leadership is given by the General Manager, and the Emergency Coordinating Committee. During this stage, attention should be given to:

PREVENTION
IS
BETTER THAN
CURE!

- Creation of the Emergency Coordinating Committee
- Vulnerability Assessment, including maintenance and retrofitting requirements
- Emergency supplies
- Mutual aid agreements
- Guest Information Packets

- Committee liaison policy
- Vital records protection
- Guest security protection
- Obtaining up-to-date weather information
- Training of staff
- Media Communications requirements*
- Insurance Coverage**

* *Media Communication requirements* will be discussed in Section V.

** *Insurance Coverage* will be discussed in Section VI

During the Hurricane

The Hurricane section includes several phases of activity, from the period when the hurricane approaches the region, to the actual strike. Time is critical, and keeping tuned to weather information and national emergency procedures is important.

Section II - During the Hurricane, outlines the responsibilities of the Emergency Coordinating Committee and each of the departments by hurricane phase.

After the Hurricane

Safety of guests, communication with the outside, and prompt resumption of business are the major considerations in the period following the hurricane. Therefore the following elements require attention immediately after the hurricane:

- Activate the Communications Plan.

- Brief assessment of damage.
- Document (photograph) damage.
- Prioritize clean-up and salvage.
- Security of property, and safety of guests. Carry out head count.
- Seek mutual aid as needed, especially for comfort of guests.
- Facilitate contact between guests and organizations to enable communication with relatives and friends.
- Liaise with travel services concerning arrangements for guests.

Structural Vulnerability & Loss Reduction

Review of damage to buildings from recent events indicate failure of aspects of the structure to resist hurricanes. Hoteliers should be made aware of how hurricanes affect buildings so as to be able to effect quality control in roofs, windows, doors, foundations and other elements of structures. Design criteria to withstand both hurricanes and earthquakes are presented and procedures for assessing vulnerability and retrofitting are outlined. Maintenance plans are important to structural soundness.

There should be a medium or long term plan for upgrading the structures of all hotels to resist known hazards.

A *good* Maintenance System is a *good* Disaster Mitigation System

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HURRICANE CHARACTERISTICS

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HURRICANE CHARACTERISTICS

SEASON: Commences June 1 and ends November 30, but storms may occur at other times of the year.

SPEED: Speed of advance of approximately 20-25km/hr (12-15 Knots).

COURSE: Normally moves from East/Southeast towards West/Northwest and Northwest during initial stages but curves towards the North as it progresses (in the Northern Hemisphere).

WIND SPEED: Wind speeds generally in excess of 135 km/hr (75 Knots) but may gust up to 315 kn/hr (175 Knots) (GILBERT Sept. 1988).

SURGE: Storm Surge may be experienced if hurricane passes close offshore 3-10m (10-33 feet) and conditions are conducive.

WIDTH: Width of destruction 170-250 km (106-155 miles).

RAINFALL: Up to 450 mm (18 in) in the first two (2) hours.

LULL: A deceptive lull lasting approximately 30 minutes occurs when the centre (the EYE) of the hurricane passes. Wind speed resumes intensity and quickly, immediately after the eye passes.

EYE: Is the centre of the hurricane where there are no winds and where barometric pressure is very low.

- **Wind damage** - This is potentially one of the most destructive aspects of the hurricane. It can result in loss of roofs, windows, doors and vegetation.
- Collapse of buildings
- **Damage by fallen trees** - Disruption of electricity and telephone facilities, damage to buildings and blocking of roads.
- **Flying debris** - Zinc sheets, tree limbs, timber, roofing materials, fruits etc. can cause further damage to other structures.
- **Rain Damage** - Otherwise sturdy trees and light poles may collapse earlier than expected due to water saturation around their bases. Leaking roofs, from torrential downpour can saturate walls and destroy contents of buildings and cause the destruction of structures.
- **Flood Damage** - Disruption of surface communications. For example, roads, flooded or washed away; landslides; bridges destroyed; railway lines flooded or washed away; contamination of drinking water supplies.
- **Storm Surge** - Heavy seas, storm waves and storm surge can cause extensive damage and completely destroy structures and coastal features. The direction of approach of the hurricane and the physical form of the coastal area will influence the potential destructive force of the waves.

Hurricane Categories

Category 1 Winds 119-152 km (74-95 mph) or storm surge 1 -1 ½ m (4-5 ft) above normal.

Category 2 Winds 154-177 km (96-110 mph) or storm surge 1 ½ -2 ½m (6-8 ft) above normal.

Category 3 Winds 178-209 km (111-130 mph) or storm surge 2 ½-3 ½m (9-12 ft) above normal.

Category 4 Winds greater than 249 km (155 mph) or storm surge greater than 5½ (18 ft) above normal.

The Warning System

The following warnings will be issued prior to a Hurricane. Members of staff should pay careful attention to these warnings as there are certain procedures to follow after each warning. Some radio and television stations in the region have a special signal which precedes warning messages. Become familiar with them.

Phase A **HURRICANE ALERT** - Hurricane entering the region.

Phase B **HURRICANE WATCH** - 36 hours to landfall.

Phase C **HURRICANE WARNING** - 24 hours to landfall.
Phase D **EMERGENCY PHASE** - Strike.

THE MANUAL

SECTION I

BEFORE THE HURRICANE STRIKES

The Emergency Management Team

In order to ensure that this emergency manual is an integral part of the culture and practice in your establishment, an emergency coordinating (EC) committee should be established. This committee will serve as the overall coordinating and executing body for all emergencies and will be responsible for managing and implementing emergency preparedness mechanisms at all stages of a hurricane.

EC Committee Structure

The members of the emergency coordinating committee should be appointed by management. At the head of the committee, is the Emergency Coordinator. An Alternate Emergency Coordinator should also be designated in the event that Emergency Coordinator is absent. The committee should also consist of a public relations person, the environmental person (if your facility has one) and at least one representative from each of the departments (or areas of the hotel or resort. These department representatives need not be managers or heads of the management team but should be any member of staff who knows the department integrally and is capable of carrying out the requirements of a committee member. Figure 1 outlines a possible structure of the emergency coordinating committee.

> TIP!!!
> The EC Committee should have a 'shadow' committee from which members can be substituted onto the EC committee if any of the regular members are absent.

EMERGENCY COORDINATING COMMITTEE

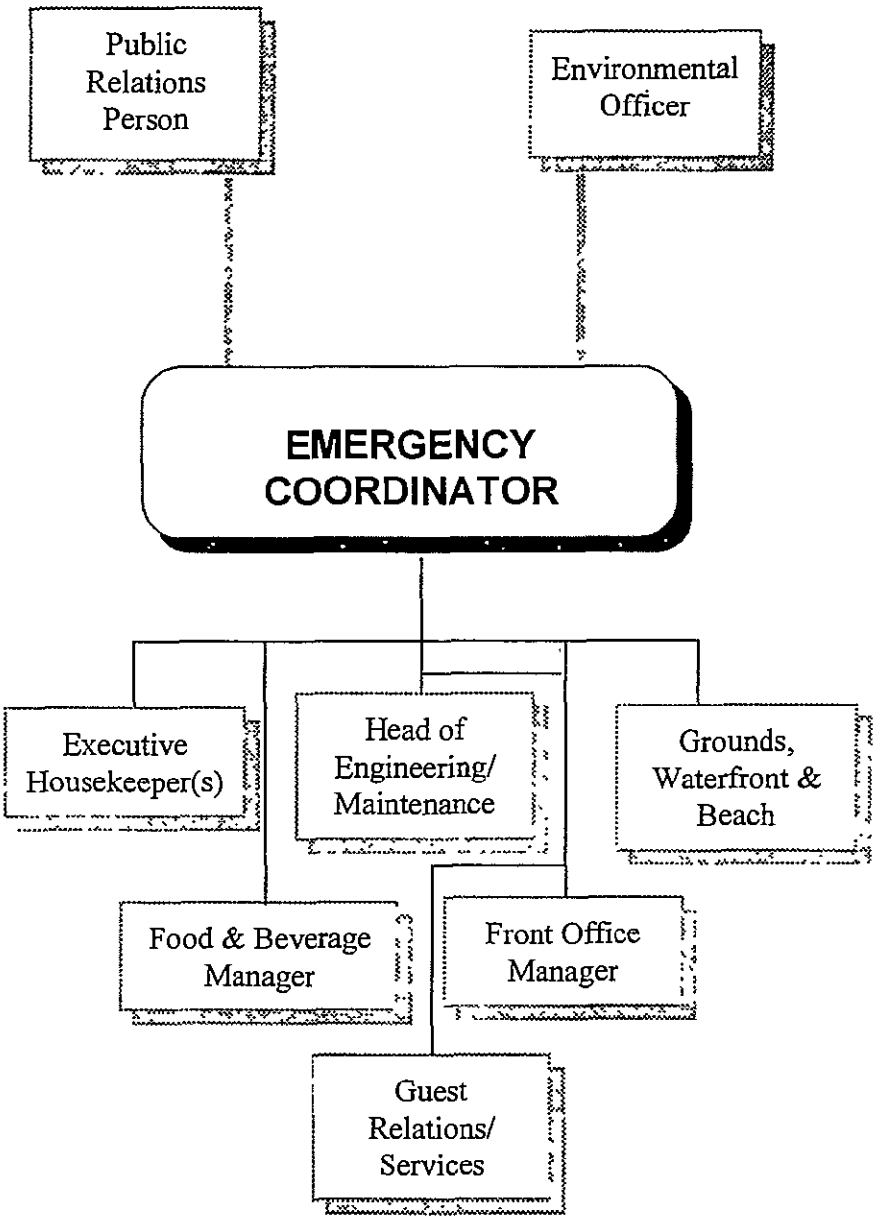


Figure 1 **Emergency Coordinating Committee Structure**

Committee Responsibilities

The first four projects of the EC Committee should be to:

(1) Familiarize themselves with the plan;

(2) Help the rest of the staff to become familiar with the plan;

(3) Designate responsibilities for action before, during and after a hurricane; and,

(4) Get first aid training.

Special Note:

It is the responsibility of the emergency coordinating committee to designate personnel to carry out the tasks described in the manual

All departments at your resort or hotel should be included when responsibilities are being assigned. These responsibilities should be made clear to each department and displayed in an openly accessible place within the department.

Suggestions for the EC Committee !!!

- The EC Committee should meet at the end of March to review the maintenance report, review priority areas for action and review hurricane procedures with all staff.

- A second meeting must be held at the beginning of June, at the start of the hurricane season, to review and assess the level of preparedness, and fine-tune procedures.

With respect to the members of the Emergency Coordinating Committee, specific responsibilities are outlined as follows:

Emergency Coordinator (General Manager)

- Create the Emergency Coordinating Committee in consultation with other management staff at the hotel or resort.

- Overall coordination of regular hotel or resort operations and hurricane procedures.

- Liaise with emergency and information services (e.g. the National Office of Disaster Preparedness and Emergency Services, the Weather Reporting Station, appropriate community contacts) as well as mutual aid partners.

- Institute preventative measures (as described throughout this manual) to minimise opportunities for emergency situations.

- Conduct vulnerability assessment of the facility in consultation with other EC members and external expertise where necessary.

- Document the incident.

- Administer First-Aid when necessary.

Environmental Officer

- Give advice to the Emergency Coordinating Committee regarding Hurricane related prevention measures and Environmental matters on the property.

Public Relations Person

- Provide the link between the resort or hotel and the community, media and international stakeholders through a Communications Plan.

- It is also the responsibility of the PR person to keep the Communications Plan alive and to activate the Plan at the relevant time.

Other Emergency Team Members

- Ensure execution of prevention and preparedness tasks.
- Supervise clean-up activities.
- Ensure that sufficient quantities of emergency supplies (e.g. batteries, band-aids, stored water, etc.) are in stock.
- Dispose of damaged material.
- Administer first-aid where necessary.

There are many tasks that must be undertaken in order to properly prepare for a hurricane. The following charts can be used as *handy checklists* for ensuring that all tasks related to hurricane preparedness are completed.

Staff Liaison

TASK	RESPONSIBILITY
General Manager should meet with Departmental Heads; and Departmental Heads with staff.	Emergency Coordinating Committee

Recommendations

- Conduct monthly meetings on hurricane procedures.

Assess Your Risk

TASK	RESPONSIBILITY
□ Check all buildings in March each year for both structural defects and non structural vulnerability. Check windows, doors, walls, roof, equipment, furniture, documents, etc. Repair or correct problems before the hurricane season.	Chief Engineer Emergency Coordinator Obtain external expertise where necessary
□ Utilize Building Assessment Safety Checklist (Form 1).	
□ Ensure compliance with National Building Code where it exists.	Chief Engineer
□ Create and implement Hurricane Maintenance Programme (esp. roof, windows, doors, etc.)	Emergency Coordinator
□ Basic maintenance budget required.	Emergency Coordinating Committee
□ Utilise the assessment reports to determine:	Emergency Coordinator/Engineering
➤ the most appropriate location within the facility which will serve as the HEADQUARTERS/COMMAND POST during the event;	Maintenance Personnel
➤ which room may be easily converted for use as a FIRST-AID CENTRE;	Emergency Coordinating Committee
➤ which rooms are most appropriate for the safety of the guests during the hurricane.	

Recommendations

➤ Vulnerability assessment (Structural) of all buildings must be instituted as a permanent function of the Engineering Department (where one exists), or given

to persons with equivalent responsibility. (See Section IV). Findings should be acted upon.

- Check non-structural vulnerability assessments twice annually - March and July each year. (Use Checklist - Form 1). The results of these assessments must be incorporated into the building maintenance programmes.

Weather Information

TASK	RESPONSIBILITY
□ Keep radio tuned to channel for news where appropriate. □ Install weather band for continuous reports during the Hurricane Season.	Emergency Coordinating Committee

Recommendations

- Acquire radio and place in main office to ensure continuous monitoring of weather information.

- If internet access is available, check the following web sites and share relevant data with EC Committee and staff.

National Hurricane Centre - http://www.nhc.noaa.gov/products_index.html
Weather Net - http://cirrus.sprl.umich.edu:80/wxnet/tropical.html
Atlantic Tropical Weather Centre -
http://banzai.neosoft.com/citylink/blake/tropical.html

- If cable or dish is available to your television, keep regular check of the weather channel to obtain updated hurricane and storm tracking information.

Vital Records

Determine secure storage areas for **VITAL RECORDS** and use for permanent on-site storage. Vital records of the company must be duplicated and stored off-site. (All magnetic tapes and computer disks should have back-ups in safe storage).

TASK	RESPONSIBILITY
☐ Inventory tasks to be carried out by head of each department (or the equivalent) in the organization/facility.	General Manager Financial Controller
☐ Inventory existing supplies.	Department Heads/EC Committee Rep.
☐ Requisition for replacement supplies.	Department Heads
☐ Prepare emergency supplies purchase orders, and keep in stock for distribution.	Department Heads

Recommendations

- Earmark and allocate funds for procurement of emergency supplies, and for regular maintenance of facilities. See suggested Emergency Supply Checklist (Form 2).
- Determine policy for handling keys and access to emergency supplies.
- Ascertain major department priority supplies for emergencies: e.g. Kitchen, Housekeeping, Engineering/Maintenance, First Aid, etc; then include in emergency budget.

TASK	RESPONSIBILITY
□ Discuss mutual aid possibilities with relevant selected persons according to need and read agreements as necessary.	General Manager
□ Review agreements annually and update status.	General Manager
□ Where possible, share resource inventories which relate to particular agreements.	General Manager
□ Negotiate purchase agreements on a contingency basis where necessary, e.g. hardware supplies.	General Manager

Recommendations

Formulate and adopt specific Mutual Aid Agreements with goods suppliers, neighbouring facilities, and operators on other islands, where applicable (Use Form 3). Areas of importance include:

- diesel and gasoline suppliers
- transportation for workers and possible evacuation of guests
- potable water
- local bakeries and food supplies
- hardware supplies
- heavy equipment service and rental companies.

TASK	RESPONSIBILITY
☐ Hold discussions on community relations and determine policy to be followed in terms of emergency assistance to community members.	General Manager
☐ Implement policy as soon as a decision is reached, by informing the National Emergency Organization, Hotel Management, staff, etc.	General Manager under direction from Corporate Body

Recommendations

➤ Define policy on acceptance of local guests in the event of a hurricane, and responsibility to the community in terms of assistance, etc.

Communications

TASK	RESPONSIBILITY
□ Section V outlines a communications strategy. Adapt this prototype to suit your property.	General Manger Public Relations Person

Recommendations

➤ The General Manager in consultation with the Board of Directors should define hotel policy on communications. **Section V** outlines steps for a communications plan.

Insurance

TASK	RESPONSIBILITIES
□ Hold discussions on insurance and determine policy to be followed. Seek advice from insurance companies.	General Manager under the direction of the Corporate Body
□ Implement policy as soon as a decision is reached.	General Manager

Recommendations

➤ The General Manager in consultation with the Board of Directors should define hotel policy on insurance coverage on physical structure, liability, and loss of profit. **Section VI** outlines steps for insurance coverage.

Having a *COMMUNICATIONS PLAN* and *ADEQUATE INSURANCE COVERAGE* are vital!

Damaging media reports as well as inadequate insurance coverage can aggravate the financial and social consequences of hurricane events

Guest Information

TASK	RESPONSIBILITY
☐ Prepare hurricane emergency procedures for guests. Keep on file.	Guest Relations/Services (see Form 4)
☐ Adapt guest information kits for condominiums and villas (as appropriate).	"
☐ Prepare a disclaimer letter for guests. Keep on file.	"

Recommendations

➤ Prepare guest information (brochures and disclaimer letter) for distribution at an appropriate time. Form 4.

TASK	RESPONSIBILITY
Provide briefing sessions for staff on hurricane procedures for the home.	Emergency Coordinator through relevant organizations, e.g. Emergency Management Agency, CHA, Red Cross.
Include training in emergency procedures in orientation programme for new employees.	Emergency Coordinator

Recommendations

Conduct on-going training programmes in the following areas for different categories of staff:

- CPR, Basic First Aid
- Response procedures outlined in the manual
- Conducting regular exercises (Drills).

TASK	RESPONSIBILITY
Establish conditions under which evacuation will be necessary and state these in the plan, determining responsibilities of members of the staff for this task.	General Manager under direction from the Corporate Body.
Determine appropriate shelter with National Emergency Organization.	Same as above.

Recommendations

- Evacuation of guests to designated national shelters should be carried out only when this is felt to be the only appropriate course of action, given conditions for guest and staff safety.

DURING THE HURRICANE

SECTION II

DURING THE HURRICANE

Emergency Coordinating Committee

Phase A: **Hurricane ALERT**

TASKS
Hurricane Information
☐ Map should be posted in the room designated as Command Centre, as instructed by General Manager, and at the Guest Information Centre Desk.
☐ Telephone Operators should be instructed to refer ALL queries on the hurricane to the General Manager or designated spokesperson. (See Section V)

Recommendations:

- A hurricane tracking map should be duplicated and used to track hurricane paths in the Caribbean.
- Record information and establish and maintain contact with National Emergency coordinator and other local responsible authorities.

Be on the alert and use map to track progress of the storm.

- Make contact with the National Emergency Office and local authorities.
- Ensure that all members of Coordinating Committee are made aware of hurricane developments.

Phase B: **Hurricane WATCH**

TASKS
Guest Information & Security
☐ Locate pre-published guest emergency procedure letters.
☐ Determine number of SAFE rooms for those persons that do not want to move to the central area. SUBMIT TO EMERGENCY TEAM. Give priority to disabled guests.

Recommendations

Make arrangements to:

- ➤ Distribute to each guest room (with assistance from General Management Personnel) a Memo and the brochure instructing guests on hurricane procedures, as it affects them. ONLY DISTRIBUTE WHEN DIRECTED TO DO SO BY GENERAL MANAGER.

TASKS

Vital Records

- ☐ Assist in securing all important files and equipment

Other Responsibilities

- ☐ Maintain hurricane tracking map at Command Post as policy dictates.
- ☐ Develop current list of key employees of Departments and contact addresses, phone numbers, etc.
- ☐ Request all needed materials and supplies based on inventory provided; should include potable water
- ☐ Arrange worker transportation

Recommendations

- ➢ General Manager, as head of Emergency Coordinating Team, meets with Team; discusses priorities for action based on activities achieved to date and staff/resource availability.

Phase B: **Hurricane WARNING**

- Emergency Coordination Committee should lead the hurricane preparation procedures for each department. (*See each department's responsibilities for details*)

Phase C: **EMERGENCY Phase**

Special Note:

During the Emergency Phase a skeleton Emergency Team of at least the General Manager and two other Committee members (preferably the Maintenance and the Kitchen Person) should remain.

TASKS
Guest Safety & Comfort (4-2 hours)
☐ Evacuate guests to designated in-house shelter. a) alternatively, to designated safe rooms b) solicit voluntary assistance from guests as may be deemed necessary.
☐ Check and ensure all rooms not designated safe are secured, unoccupied, and locked.
☐ Address guests on activities for duration of hurricane.
☐ Distribute games and/or initiate schedule of activities for guests (with assistance from volunteers).

GENERAL MANAGER / OFFICES

Phase A: **Hurricane ALERT**

➤ Provide assistance and information to the EC Committee where and when - ever necessary.

Phase B: **Hurricane WATCH**

TASKS
Guest Information & Security
☐ Determine number of guests likely to be resident at landfall of hurricane.
☐ Liaise with sales and marketing personnel.

TASKS
Guest Information & Security
☐ Determine schedule of events/ entertainment etc. available for guests to be included in guest memo.
☐ Obtain list of all the guests and their room numbers. All EC Committee members should get a copy.

Recommendations

- ➤ Review and backup computer files. Place existing hard copies, accounts, receipts, etc., in secure filing cabinets, away from areas subject to flooding etc.
- ➤ Ensure staff on hand to settle guests' bills where this has been adopted as established procedure.

TASKS
Mutual Aid
☐ Reconfirmation of Mutual Aid Agreement, if necessary, and revision of requirements as perceived.
Staff Roster
☐ Develop list and submit to Emergency Team.
☐ Recall all key personnel as deemed necessary.
☐ Make tentative arrangements for those who will stay on premises.
☐ Distribute all key personnel as deemed necessary.

GENERAL MANAGER / OFFICES

Recommendations:

- Check and revise phone numbers of all Department Heads, Supervisors, and key personnel. Develop alternate list chart, dependent on those persons available (i.e. not on vacation, sick, etc.).
- Make arrangements for employees to manage facility and guests during the crisis. Develop Staff Roster.
- Allow employees time to make emergency preparations of their homes, ensuring they leave contact addresses, and are aware of possible rotation of staff roster.

Phase C: **Hurricane WARNING**

TASKS
Protection of Equipment, Supplies, and Vital Records (18-12 hours)
☐ Secure and make sure adequate supplies of polyethelene sheeting available to cover desks, and equipment as needed.
☐ Where necessary, prepare area for storage of small electrical items-(e.g. Calculators).
☐ Disconnect and store all electrical appliances which will not be used up to the point of electrical failure.
Guest Accounts (12-6 hours)
☐ Secure and lock away all vital records that are not necessary for usage within the next 24 hours.
☐ Ensure all guest bills are paid or locked away in filing cabinets.
Staff Duty
☐ Discharge all staff not required to be on hand.
☐ Record and verify names of staff on duty.

KITCHEN

Phase A: Hurricane ALERT/WATCH

TASKS
Food and Water Supplies
☐ Take inventory of canned meats, vegetables, drinks, disposable sanitary ware, etc. (See Form 2).
☐ Report status to General Manager or Team Leader, request additional supplies as necessary.

Recommendations

➤ Conduct briefing meeting with kitchen staff, identifying priority tasks and delegate according to specific time requirements.

TASKS
Menu
☐ Create cycle menu based on inventory.
☐ Serve buffet style meals as determined necessary.
☐ Sterilize and fill all available water containers; store in a safe place.
☐ Make tentative arrangements with staff concerning possible rotation; establish contact addresses for key persons.
☐ Allow staff to make personal emergency preparations.

KITCHEN

Phase B: **Hurricane WATCH**

TASKS

Lighting, Cleaning, Mopping

- ☐ Ensure provision of Emergency Lighting.
- ☐ Place mops, buckets, garbage cans, etc. in strategic locations.

Recommendations:

- ➤ Prepare for service during emergency phase.

KITCHEN

Phase C: Hurricane WARNING/EMERGENCY Phase

TASKS
Food and Drink Service (12 hours up to Emergency Phase)
☐ Set up tea/coffee/drink stations in or near designated shelter area, or safe blocks of rooms, using vacuum containers.
☐ Raise or remove all items on floor areas subject to flooding
☐ Prepare safe dining area and set up tables for guests
☐ Arrange sterno heating with safe guard sternos. Arrange dishes and food
☐ Close bars- no alcohol to be available
☐ Serve sandwiches, soups, cold drinks- if all else fails
☐ Chill canned juices/sodas to reduce demand for ice

KITCHEN

Phase B: Hurricane WATCH

TASKS
Lighting, Cleaning, Mopping
☐ Ensure provision of Emergency Lighting.
☐ Place mops, buckets, garbage cans, etc. in strategic locations.

Recommendations:

➤ Prepare for service during emergency phase.

KITCHEN

Phase C: Hurricane WARNING/EMERGENCY Phase

TASKS
Food and Drink Service (12 hours up to Emergency Phase)
☐ Set up tea/coffee/drink stations in or near designated shelter area, or safe blocks of rooms, using vacuum containers.
☐ Raise or remove all items on floor areas subject to flooding
☐ Prepare safe dining area and set up tables for guests
☐ Arrange sterno heating with safe guard sternos. Arrange dishes and food
☐ Close bars- no alcohol to be available
☐ Serve sandwiches, soups, cold drinks- if all else fails
☐ Chill canned juices/sodas to reduce demand for ice

MAINTENANCE & ENGINEERING DEPARTMENT

Phase A: **Hurricane ALERT**

TASKS
Cleaning
☐ Clean all drains and remove debris on roofs/ drainage ditches
☐ Clear or prepare rooms appropriate for storage of pool furniture

Recommendations:

- ➤ Alert staff and brief them on developments.
- ➤ Delegate and assign specific tasks, and define objectives in terms of time.

MAINTENANCE & ENGINEERING DEPARTMENT

TASKS

Storage

- ☐ Store pool chemicals
- ☐ Clean out all floor drains
- ☐ Prepare plywood and plastic sheeting to cover transformers in the event of leaks.

Emergency Supplies

- ☐ Inventory existing emergency supplies and detail requests for additional supplies as necessary.

Standby Generators

- ☐ Service plant and emergency generators.
  - ➤ Replenish diesel fuel
  - ➤ Service all cables and oil filters.
- ☐ Test generator to check output reliability.
- ☐ Provide rain/wind protection around plant.

Transport Vehicles

- ☐ Check operating condition and service all transport vehicles.
- ☐ Fill vehicles with fuel

Phase B: **Hurricane WATCH**

TASKS

Grounds

- ☐ Trim limbs from large trees or those near buildings.
- ☐ Remove coconuts from trees.
- ☐ Clear drains — including roofs.

Water Tanks

- ☐ Fill water tanks with emergency water supplies.

Emergency Equipment

- ☐ Service and test emergency power generators under load, prior to emergency use.
- ☐ Check conditions of emergency equipment to ensure it is operable.
- ☐ Secure emergency lighting supplies for kitchen, if generator not available.
- ☐ Remove and store wind breaks from fences.

Flooding

- ☐ Fill sandbags to protect areas from flooding, where appropriate.

Phase C: **Hurricane WARNING**

TASKS
Air Conditioning
☐ Operate air conditioning/boilers until power fails.
Shutters
☐ Install plywood or storm shutters to areas of glass or deemed most vulnerable to breakage.
Drains (12 Hours)
☐ Ensure final check of drains cleared, including roof drains.
Tennis Courts
☐ Remove nets from courts and store in secure area.
Swimming Pool (As necessary)
☐ Lower water in pool by 2-3 feet.
☐ If flooding begins in critical areas, use pumps to discharge storm water.
Satellite Dishes, Flags, Sign Boards, etc. (6-12 hours)
☐ Dismantle satellite dishes, antennas, umbrellas, flags, sign boards, etc.
Pool Furniture (6 hours)
☐ Store pool furniture not stored in pool. Secure those that need be, with rope.

TASKS

Other Preparations

- ☐ Tie down all other equipment which needs to be secured.
- ☐ Load cameras with film.

HOUSEKEEPING/ LAUNDRY

Phase A: **Hurricane ALERT**

TASKS	
☐	Compile updated list of housekeeping staff, and establish a tentative roster.
☐	All linen to be secured.
☐	Distribute Guest Emergency procedures on direction from the Emergency Coordinator.

Recommendation:

- ➤ Alert staff of conditions, and delegate tasks with respect to securing laundry facilities. Ensure that adequate linen, etc. are available.

Phase B / C: Hurricane WATCH / WARNING

TASKS

24 hours

- ☐ Remove all patio furniture and pots and place in rooms.
- ☐ Begin to secure rugs (roll up) drapes or remove and store in secure position in unoccupied guest rooms.

18 hours

- ☐ Ensure that emergency lighting is available in all designated safe rooms.
- ☐ All television sets (alarm clocks, radios etc.) should be secured in garbage bags, taped/stored in cupboards starting with unoccupied rooms.
- ☐ Guests should be provided with large garbage bags to wrap suitcases.

8 hours

- ☐ Finish securing all room furniture, draperies, etc.
- ☐ Close all louvers securely in rooms.
- ☐ Close all doors in unoccupied rooms.
  - ➤ Place all small damageable items in rooms not occupied, in closets, e.g. lamps, bed linen, etc.

6 hours

- ☐ Ensure all tubs are filled in guest rooms with water for guest use.
- ☐ Housekeeping to use old sheeting to stuff windows and under doors to prevent rain from soaking (assisted by ground staff).

Phase A / B / C: Hurricane ALERT / WATCH / WARNING

TASKS
Trees & Shrubbery
☐ Trim trees.
Secure Objects
☐ Secure all outdoor signs.
☐ Secure all big lighting fixtures that could be blown away or other wise damaged.
☐ Secure nets/tennis courts.
☐ All loose objects to be secured and stored indoors where possible.
Shutters
☐ Raise emergency guest shutters in rooms where supply exists.
☐ Ensure sandbags are in place in critical areas where required.
Assist Housekeeping
☐ Assist housekeeping staff to secure rooms.

TASKS

Staff Schedule

- ☐ Establish necessary rotation schedule for backup.

Emergency Lighting

- ☐ Secure lighting for immediate use. Activate radio with battery, and alternative communication facilities where established.
- ☐ Secure all important files, equipment, and data.

Recommendation:

➤ Determine adequacy of backup personnel.

Phase B / C: Hurricane WATCH / WARNING

TASKS
Security Posts
☐ Establish security posts.
☐ Take all steps necessary to ensure safety of all personal property.
Emergency Phase
☐ Be on the alert for damages in the area and record.
☐ Be on the lookout for intruders who will take advantage of the uncertain situation.

SECTION III

RECOVERY AND RESTORATION

RECOVERY AND RESTORATION

Immediately after a hurricane there are many tasks that must be attended to in order that operations are returned to normal as soon as possible.

The following **TASK/ RESPONSIBILITY** checklists should be used to ensure that all necessary tasks towards full recovery and restoration are completed.

Immediate Post Hurricane Hours

TASKS	RESPONSIBILITY
☐ Establish overall ability to provide service to guests, based on resource availability, including Mutual Aid Agreements.	General Manager and Emergency Coordinating Team
☐ Review and assessment resources to assist in clean-up and salvage operations and detailed damage assessment.	General Manager and Emergency Coordinating Team
☐ Deploy staff available into teams with responsibility for: ➤ Damage Assessments (use Damage Assessment Report Form) and ➤ Clean-up Salvage	General Manager and Emergency Coordinating Team
☐ Assess shortfalls in returning to normal operations.	General Manager and Emergency Coordinating Team

TASKS	RESPONSIBILITY
☐ Assess and negotiate for joint use, lending, borrowing, and sharing of facilities, equipment, and personnel services.	General Manager and Emergency Coordinating Team
Guest Relations	
☐ Carry out head count of guests.	Emergency Coordinating Team
☐ Find alternative accommodations for guests, if this proves necessary, utilizing mutual aid agreements.	General Manager and Emergency Coordinating Team
☐ Use media, where necessary, to provide workers with information regarding resumption of duties.	General Manager and Emergency Coordinating Team
☐ Liaise with travel services and provide guests with information on possible travel arrangements, given the state of these services.	General Manager and Emergency Coordinating Team
☐ Facilitate contact between guests and those organizations which may be able to facilitate communication with their relatives and friends, for example; local Embassies, the Red Cross, or American Express.	General Manager and Emergency Coordinating Team
☐ Provide guests with information on interim arrangements being provided for their comfort and safety.	Emergency Coordinating Team

Special Note:

The Damage Assessment Team could be composed of Emergency Coordinating Team members.

Recommendations

- The Emergency Management Team members should make a brief assessment of the damage then meet to discuss and agree on priority activities to be taken.
- The Manager should activate Mutual Aid Agreements (inter-hotel/company agreements for recovery operations.)
- Provide information to guests to reduce their anxiety and to assure them that their interests are not being neglected.
- Accurate information to the media should be provided as requested. Ensure that statements to the press are accurate, and brief, and without exaggeration. Be positive. (See the Communication Plan - Section V)
- The loss of credibility with the public and guests following a crisis, such as a hurricane, could affect future operations, market share, and customer base.

Note:

Emphasis should be placed on security to property and guests in this vulnerable state.

TASKS	RESPONSIBILITY
☐ Consult Priority Repairs Needs Report, developed by the initial inspection team immediately following the event (See Damage Assessment Report).	General Manager and Engineering and Maintenance
☐ Photograph damage	Damage Assessment Team
☐ Survey properties on basis of priority identified above. Insurance under-writer to accompany team/or retained quantity surveyor.	Damage Assessment Team
☐ Itemize structural and non-structural damage.	Damage Assessment Team
☐ Itemize damage to specific building equipment.	Damage Assessment Team
☐ Itemize damage to utilities and communications systems.	Damage Assessment Team
☐ Identify need for contracted services.	Engineering and Maintenance
☐ Identify labour and material needs for damage repair.	Engineering and Maintenance
☐ Estimate each building's repair costs.	Engineering and Maintenance
☐ Summarize damage survey with estimated repair cost.	Engineering and Maintenance
☐ Develop recovery schedule.	Engineering and Maintenance
☐ Request advice on redesign or modification of vulnerable elements.	Engineering and Maintenance

Recommendations

- ➤ Assess structural and non-structural weaknesses which contributed to damage.

	TASKS	RESPONSIBILITY
☐	Identify disrupted telephone and power services, water shortages, damage to major transportation routes, and disruption of public transportation facilities.	General Manager and Emergency Coordinating Team
☐	Ascertain projected restoration period.	General Manager
☐	Contact employees to ascertain extent to which personal damage and dislocation will prevent work resumption.	Emergency Coordinating Team
☐	Assess level of human resources needed for recovery work.	General Manager
☐	Make decision relative to hiring temporary personnel.	General Manager
☐	Assess reallocation of resources and unplanned expenditure.	General Manager

Recommendations

- Identify effect of event on total environment within which each property is located.
- Determine emergency measures needed to facilitate business restoration in the interim short-term period prior to full recovery.
- Identify areas of dislocation.

Clean Up And Salvage

TASKS	RESPONSIBILITY
☐ Establish temporary dump on premises, where necessary.	Emergency Coordinating Team
☐ Activate clean-up and salvage team.	General Manager
☐ Activate mutual aid for transportation and other support for recovery activities.	General Manager
☐ Clean-up facilities; utilize voluntary assistance of those guests with any interest.	Clean-up and Salvage Team
☐ Secure contractor services where needed.	General Manager
☐ Request professional assistance if necessary.	General Manager

Recommendations

- ➤ Identify, remove, and dispose of rubble and debris.

TASKS	RESPONSIBILITY
☐ Activate plan for temporary front office, in the event of damage.	General Manager
☐ Ensure that key personnel (or back-up staff) report to headquarters, provide assistance where necessary.	General Manager
☐ Provide transportation for movement of key personnel and supplies.	General Manager
☐ Implement recovery plan for business operations, revising marketing strategy as opportunity presents itself.	General Manager

Recommendations

- Examine possibilities for change in marketing strategies, as in many instances, accommodation facilities for relief and rehabilitation workers are required.

Business restoration must be effected for the hotel if this is feasible given the level of damage.

TASKS	RESPONSIBILITY
☐ Obtain information on extent and magnitude of damage to overall area in which the properties are located.	General Manager and Emergency Coordinating Team
☐ Obtain information on governmental action schedule to restore roads and utilities.	General Manager
☐ Negotiate assistance for structural inspection and demolition, where necessary.	General Manager
☐ Negotiate several permits, as may be required, for recovery operations.	General Manager
☐ Make known any assistance which the hotel can provide to the community, e.g. shelter, food, etc.	General Manager or Public Relations Person

Recommendations:

- ➤ Establish and maintain means of communication exchange with relevant public sector agencies.
- ➤ Consult matrix of responsibilities in local National Disaster Plan to determine which agencies to contact in case of need.

SECTION IV

STRUCTURAL VULNERABILITY AND LOSS-REDUCTION TECHNIQUES

INTRODUCTION

The section provides guidelines for vulnerability assessments; acceptable criteria and codes for design of structures; performance specifications for procurement; guidelines for contracting, briefing and monitoring of consultants engaged to undertake vulnerability analyses on existing facilities; procedures for the reduction of vulnerability of existing installations including routine and preventative maintenance and retrofitting. The ultimate goal is to reduce the element of surprise by providing buildings and structures with predictable performance at affordable costs.

The ultimate goal is predictable performance at affordable costs

The review of damage to most buildings from recent hurricanes in the Caribbean showed that roof failure was the primary cause of problems, leading in some cases to complete collapse of the walls. Some roof structures failed as in a hotel in St. Thomas, but generally, the failures can be attributed to the use of light weight roofing material such as 26 gauge galvanised sheeting or aluminum sheeting. Some roofs remained partially intact but the damage to windows, doors and internal partitions was significant. It is recognised that after hurricane damage has occurred there must be a hasty response to the damage by replacing the damaged facilities as quickly as possible, especially in those cases where the hotel has guests. However, it is disturbing to note that reconstruction of many of the hotels which suffered from the recent hurricanes has been based on the same design concepts and the same materials which led to the failures have been used again.

There should be a medium or long term plan for upgrading the structure s of all hotels to enable the buildings to resist the known hazards.

Proof of structural integrity can reduce insurance premiums

Providing comfortable and safe leisure facilities as well as reducing insurance premiums should be an important objective of hoteliers throughout the Caribbean. Insurance and reinsurance premiums are becoming more expensive and difficult to obtain for facilities which are unable to prove their structural integrity.

There should be a medium or long term plan for upgrading the structure of all hotels to enable the buildings to resist the known hazards.

HOW HURRICANES AFFECT BUILDING

Hurricanes subject buildings to winds from several different directions, heavy rains, and in some cases storm surge. Buildings must therefore be designed to resist not only **high wind speed** from all directions, but **heavy rain** and **storm surge.**

WIND

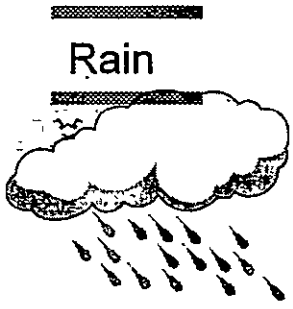
Wind damage is caused by wrenching and bending forces imposed by gusting winds and the rapid increase in wind force as wind speed increases. With a doubling in wind speed the wind force on the structure increases four times. Wind striking a building produces pressure which pushes against the building on the windward side, and suction which pulls the building on the leeward side. Failure may occur when the external pressure and suction on the wall combine to push and pull the building off its foundation.

If the building is not securely tied to its foundation, and the walls cannot resist the push/pull forces subjected to them, the structure tends to collapse, starting at the roof, with the building leaning in the direction of the wind.

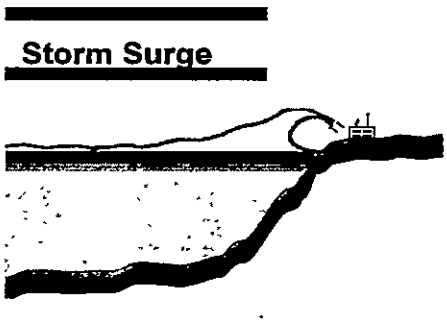
Hurricane winds can also lift the roofs of buildings. In most cases

Hurricane winds can also lift the roofs of buildings. In most cases this uplifting effect is the result of the difference in the speed of the wind over the roof. Lower pressures on the leeward side can cause the entire roof to lift up off the walls.

Wind entering the structure through broken or open windows and doors can add to this lifting effect.



The torrential rains that result from hurricanes can intensify flood damage to those facilities affected by storm surge, and can also cause flooding in non-coastal areas. The indirect effects include power outages and the saturation of the interior of buildings with salt and water.



Storm surge can result in great damage to facilities, even if the hurricane is at some distance away from the coast. The force of winds can push waves toward the shore causing significantly higher water levels at the coastline. The resulting flooding can cause considerable damage, even to properties which are in areas where wind damage is negligible, and severe damage to those properties in areas that are directly hit by hurricane force winds.

QUALITY CONTROL IN CONSTRUCTION

General

After a disaster, avoidable structural damage is a major culprit. Such structural damage is mainly due to inadequate control of quality at all stages of the process - **design, detailing, construction and maintenance.**

Formal quality assurance procedures should be adopted to ensure that buildings are designed and constructed in accordance with the relevant standards and particularly that proper detailing has been done.

Regulatory Environment

❒ *Building Codes*

Checking of compliance with required standards is very important. There is no need to wait for setting up an elaborate inspectorate before mandating building codes. The system of check or review consultants (*bureaux de contrôle*), routinely used in French territories, is also used with variations in Colombia and in Canada (British Columbia). It has been used on several major projects in the Commonwealth Caribbean, principally at the instigation of catastrophe-insurance providers. Other building codes notably the OECS and Turks and Caicos Codes also mandate the use of a special inspector for the review of plans and construction for important buildings. The review consultant should not be otherwise involved with the project and should report to the owner on all critical stages of the project.

Codes and Standards

The Caribbean Uniform Building Code (CUBiC) contains building standards which if properly used will reduce the vulnerability of structures to natural hazards.

The Code contains Sections on:

- **Administration of the Code**
- **Structural Design Requirements**
- **Occupancy, Fire Safety and Public Health Requirements**

The technical standards in the OECS Codes are based on the CUBiC standards, but building regulation in each territory is different. Two OECS countries have approved or passed legislation mandating the use of the Code.

> The mandatory implementation of a good code can lead to the reduction in the cost of safe buildings

However, it is recommended that the CUBiC standards or other appropriate codes be used by all design professionals in the CHA member countries. The mandatory implementation of a good code with appropriate standards is likely to lead to the reduction in the cost of safe buildings by encouraging more appropriate conceptual designs.

Earthquakes versus Hurricanes

There is a basic difference in the performance expectations of buildings with respect to hurricanes and earthquakes. A building is expected to survive its **"design hurricane"** with virtually no damage. Even a catastrophic hurricane should only lead to repairable damage. On the other hand, the **"design earthquake"** is expected to cause (hopefully repairable) damage. A catastrophic earthquake may result in irrepairable damage and the building must be demolished. In such an event success is measured by the absence of deaths and serious injuries. The table below compares these issues.

MAIN DIFFERENCES BETWEEN HURRICANES AND EARTHQUAKES

ISSUE UNDER CONSIDERATION		WIND EFFECTS	EARTHQUAKE EFFECTS
(1)	Source of loading	External force due to wind pressures	Applied movements from ground vibration
(2)	Type and duration of loading	Wind storm of several hours' duration; loads fluctuate, but predominantly in one direction	Transient cyclic loads of at most a few minutes' duration; loads change direction repeatedly
(3)	Predictability of loads	Usually good, by extrapolation from records or by analysis of site and wind patterns	Poor; little statistical certainty of magnitude of vibrations or their effects
(4)	Influence of local soil conditions on response.	Unimportant	Can be very important
(5)	Main factors affecting building response	External shape and size of building; dynamic properties unimportant except for very slender structures	Response governed by building dynamic properties: fundamental period, damping and mass
(6)	Normal design basis for maximum credible event	Elastic response required	Inelastic response permitted, but ductility must be provided; design is for a small fraction of the loads corresponding to elastic response
(7)	Design of non-structural elements	Loading confined to external cladding	Entire building contents shaken and must be designed appropriately

Source: The Arup Journal

CRITERIA FOR NEW CONSTRUCTION

There are a number of areas to which careful consideration should be given during the construction of a new hotel. These include :-

- ❒ Site and orientation
- ❒ Shape of the facility
- ❒ Foundations
- ❒ Framing and cladding
- ❒ Roofs
- ❒ Porches
- ❒ Shutters

SITE AND ORIENTATION

- ❒ Sites should be sheltered and be accessible at all times from centres of population.

- ❒ Avoid building on steep slopes where there is little shelter from high winds.

- ❒ If steep slopes cannot be avoided, they should be cut in as shown in Figure 1, Appendix II. The task of supporting structures on steep slopes can be difficult and most times expose the underside of the structure, making it easy to topple in high winds.

- ❒ When cutting into slopes for construction, pay attention to the cut to ensure that erosion and landslides will not result from the site work.

- The earth should be cut below the 'slippage' angle or angle of repose for the soil type under consideration.

- Hill tops should be avoided as they are less protected from high winds.

- Topography should allow for easy access by helicopter.

- Site should not be restricted in order to allow for the temporary extension of facilities.

- Where there is a history of flooding in the region hotel owners should acquaint themselves with the history of the area before deciding to construct; this would help to minimise loss of property and life when flooding occurs.

- Orientation of buildings is not critical as hurricane wind forces can be from any direction and vary continuously.

- Avoid "Pockets" in building plans.

SHAPE OF FACILITIES

- The shape of the facility is an important factor to be considered when thinking of resistance to high winds.

- Avoid 'T' or 'L' shaped houses as they are vulnerable to high winds because they channel the wind into the junction of the two wings, leading to failure. (Figure 2 in Appendix II)

When building rectangular shaped houses, the best length to width ratio is 3:1 or less.

- Roofs should be designed to provide resistance to high winds and should be steep (≤ 30 degrees).

FOUNDATIONS

- Foundation weights should be great enough to avoid overturning or 'uprooting' of structure.

- Foundations should be reinforced with the use of mild steel bars, and bars should project beyond the foundation by at least 12 to 14 inches to facilitate the securing of the structure to the foundation.

- The footing of the foundation should be specific to hotels.

- If wood posts are used instead of concrete blocks or column foundation, the post should be treated with preservative and then buried in concrete at least 4 to 8 inches into the ground.

- The post should have a minimum dimension of 6 x 6 inches .

- The minimum diameter for round posts should be 8 inches, the hole in which the pole is placed should be larger than the post to accommodate the backfill.

- Foundations of buildings located in flood plains must be designed to withstand dynamic water force and battering action from floating debris, and the effects of erosion due to scouring.

FRAMING

- ❒ Cladding material used should provide sufficient strength and adequate bracing to withstand high winds.

- ❒ Studs should be located at 2'-0" centres with midway noggins.

- ❒ Studs should be doubled around openings (doors, windows) as openings in a wooden structure tend to weaken it.

- ❒ Metal straps (T's and L's) plus corner braces must be used to secure studs to top and bottom plates and at the corners of the structure.

- ❒ The space between the roof and wall should be closed up. Ventilation space should be left in Gable ends.

- ❒ Concrete block and clay block infill panels should be reinforced and tied to the main structure to avoid shearing, 'popping' or collapse.

- ❒ Design of fixings is important as this provides strength and flexibility.

- ❒ Joints and junction of panels should be carefully designed against leaking.

- ❒ Glass curtain wall systems must be avoided, or protected against flying debris.

ROOFS

- ❒ Avoid half porches, as wind trapped underneath an open or half porch will increase high uplift forces on the roof.

- ❒ If half porches are to be constructed strengthened ceilings should be provided.

- ❒ Roofs of full porches should be separated from the rest of the house so that during hurricane failure of the porch, the main structure will not be damaged.

SHUTTERS AND WINDOWS

Shutters

This is a disappearing feature in an area of the world where it is most needed. Shutters seem to be considered an unattractive feature and is usually overlooked in modern construction. However their construction should not be overlooked as the glass doors and windows offer very little resistance to high winds. Therefore:

- ❒ Shutters should be provided for all windows.
- ❒ If shutters are removable, they should be able to be installed quickly and easily.
- ❒ Construction of shutters also avoid problems created in hanging or locating elements immediately before hurricanes.

Windows

- ❒ Areas of glass should be limited and protected.
- ❒ Glass should be reinforced or otherwise prevented from shattering.
- ❒ Timber or metal louvres have been proven to have the highest resistance from shattering, while glass is prone to shattering from flying debris.
- ❒ All windows should be carefully designed, with a properly fixed frame to avoid entire banks of windows being blown in or sucked out.

- ❒ Large window areas must be carefully constructed.
- ❒ Awning type windows are generally not recommended as those that are available
  are structurally inferior.

DESIGN AND CONSTRUCTION RECOMMENDATIONS

1. Have all parts of buildings (doors roofs, cladding) designed to withstand high wind pressure including suction.

2. Obtain the necessary Permits for building from the Local Authority.

3. Have detailed drawings and specifications which cover aspects of construction.

4. Ensure that persons involved in construction are sufficiently experienced and qualified in hurricane and flood resistance.

5. Secure all plates to foundations by means of bolts, straps, wood bracing or using special connectors to resist wind or water pressures.

6. Secure all studs to sill plates and top plates with metal connectors or any other straps that may be available.

7. Ensure that metal straps or connectors have been used to make a positive connection from the foundation to the structural members of the roof.

8. Make certain that all materials used and techniques employed provide adequate strength for withstanding potential hazards.

STRUCTURAL VULNERABILITY AUDITS

Structural vulnerability audits should be conducted by a qualified engineer in collaboration with a geotechnical engineer. An important task in this assessment is an inspection survey of all the buildings to be audited.

The three main methods of conducting vulnerability audits are :-

- **Detailed analytical method**
- **Approximate analytical method**
- **Field evaluation method**

The Field Evaluation Method uses data obtained from visual inspection and is widely used. It provides an assessment based on past experiences of the buildings with similar geometry, stiffness characteristics, material types, connections and anchorages; it expresses the assessment in general subjective terms such as fair, poor, good, with respect to resistence to extreme winds etc. In the absence of subsoil information, the method also assumes average soil conditions and effects.

This method assigns a rating to the various main characteristics such as symmetry and quantity of resisting elements, anchorage and diaphragm stiffness. The individual

- Cladding material used should provide sufficient strength and adequate bracing to withstand high winds.

- Studs should be located at 2'-0" centres with midway noggins.

- Studs should be doubled around openings (doors, windows) as openings in a wooden structure tend to weaken it.

- Metal straps (T's and L's) plus corner braces must be used to secure studs to top and bottom plates and at the corners of the structure.

- The space between the roof and wall should be closed up. Ventilation space should be left in Gable ends.

- Concrete block and clay block infill panels should be reinforced and tied to the main structure to avoid shearing, 'popping' or collapse.

- Design of fixings is important as this provides strength and flexibility.

- Joints and junction of panels should be carefully designed against leaking.

- Glass curtain wall systems must be avoided, or protected against flying debris.

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- Construction of shutters also avoid problems created in hanging or locating elements immediately before hurricanes.

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- Timber or metal louvres have been proven to have the highest resistance from shattering, while glass is prone to shattering from flying debris.
- All windows should be carefully designed, with a properly fixed frame to avoid entire banks of windows being blown in or sucked out.

- fascia boards must be installed.
- ventilation should be provided to boxed eaves to remove humidity and most importantly to equalise the interior and exterior pressures; they should be placed in overhangs.
- eaves should be as short as possible; shorter eaves and reduce the upward thrust by the action of hurricane winds.
- gutters should be securely fixed.
- sheet and ridge cap should be made to over lap the barge board and be secured with 1" nails.

- Pitch of the roof should be between 30° and 40° with closed gables.
- Timber flat roofs membrane or built-up roofing are not recommended.
- Laths should not be placed flat but on edge and should be not more that 2'-0" apart.
- Row of roofing nails at the ridge and eave of the roof should be one nail for each corrugation; for rows in between, there should be one nail every other corrugation.
- Ridge laps should be 6" - 8" to prevent leaks caused by driving rain and capillary action.
- Nail collar ties should be nailed to the side of the rafters, and not the face, so as to avoid the nails pulling out.

- Replace all loose, broken and corroded sheets and tiles.

- Replace rotten purlins and rafters making sure that the drive screws are driven into solid material and cannot be pulled out easily.

- Replace rotten wall plate to be sure it is not rotten- if so, replace it and secure the plate to the wall by bolts.

- Along the eaves and ridge, increase the number of drive screws in the roof sheets by at least 50 percent as the pressures are greatest in these areas.

- Install hurricane clips to connect the studs to the plate and to connect the roof rafters to the studs- this is an important exercise and is not costly.

- Try to install a clip on each rafter and use metal plates made of cut galvanised sheet to connect the members of the roof rafters together, nails holding the timbers together are easily pulled out especially where the timber is not sound, metal or wooden straps are necessary (Figure 4).

- Overhanging eaves should be sealed, this reduces vulnerability. Phase work as ceiling may be expensive.

- If the roof is a gable, you may be able to install louvres in the gables just under the ridge to act as ventilators-this would reduce the pressures lifting the roof off.

- If the verandah roof (or balcony roofs) is not separate from the main roof, you will have to strengthen the roof at the junction of the balcony roof with the main roof, by increasing the hurricane clips on the rafters and by increasing the number of drive screws at the eave of the balcony roof and also at the eave of the main roof.

- The connections of the supports of the balcony roof must also be strengthened. Ensure columns supporting the balcony roof are firmly connected to the ground or floor beam and to the roof plate. Very often the metal connections are rusted. They should be replaced immediately.

- If possible, board in the verandah so as to prevent upward pressures on the roof, the vulnerability of such roofs remains high. It is recommended that the balcony roofs be separated from the main roof.

- Check to see if the equipment mounted on the roof is firmly fixed to the roof underlying structure. If not, arrange to have the mountings installed.

Emphasis should be placed on the following areas:

➢ ***FOUNDATION***

Existing structures which do not meet construction standards for foundations should be improved by the following :-

- Building proper pillars and securing the structure to them.

- Strengthening wooden pillars by excavating around the pillars and casting into the ground with concrete 1:2:3 and bracing the pillars to provide lateral support to resist wind action (Figure 3 in Appendix II).

Where there are buildings with reinforced concrete block pillars with no projecting steel bars left to help secure the structure to the foundation, the installation of a metal strap fastened to the pillars which in turn is nailed to the bottom plate can offer some measure resistance.

➢ ***FRAMING***

- installation of additional studding and noggins can be done easily, as well as the installation of T's and L's and corner bracing.

- T's should be used to connect the studs to the bottom and top plates of the skeletal frame of the building.

- L's should be used to connect the corners of the bottom and top plate.

➤ ***WINDOWS AND SHUTTERS***

- Simple and quick methods of shuttering or shielding should be provided to all windows.
- Traditional or metal roller shutters are alternatives.
- Ensure operators on all louvre windows are working.
- Replace all broken glass in window.

➤ ***LANDS AND GROUNDS***

- Eatablish a programme for periodic inspection and pruning of trees in built-up areas.

- Inspect terraced areas and slopes periodically, and maintain to avoid erosion

- Inspect ground surface ingredients and drainage systems periodically and

keep free of dirt and debris.

- Institute a programme of planting special trees and shrubs on steep slopes to combat land slippage.

FOUNDATIONS

- Solid cement/concrete pillars firmly embedded 18 inches in ground with 1/2" rebar extending 12 inches above foundation.
- Wooden pillars (6" x 6" minimum or 8" diameter) treated lumber, sunk more than 4 feet into the ground.

WALLS

- Wall plate/sill attached to cement foundation/pillars by bolted rebar.
- Wall plate/sill attached to wooden pillars by straps and nails.
- Floor joists toe-nailed to wall plate.
- Wall uprights (studs) fixed to sill and top wall plate with hurricane straps.
- Wall uprights (studs) located at 1' - 0" centres.
- Double studs around doors and windows and cross braces at corners.

WINDOWS/DOORS

- Shutters made and attached for rapid closing **or** shutters pre-made and stored to be nailed in place before storm strikes.
- Staff trained to keep all entrances closed throughout storm period and/or open Entrance on opposite sides of buildings to allow air pressure to neutralize.

➢ ***DOORS AND WINDOWS***

- Examine doors and windows, they must close tightly.
- Ensure that operators on louvre windows are all working.
- Replace all broken glass in windows.
- Check hurricane shutters (if any) to see that they work.
- If the building has large glass sliding doors or glass windows without hurricane shutters, there would need to be sheets of plywood on hand for protecting the glass when a hurricane warning is announced. Permanent hurricane shutters built of timber would be useful; or aluminum hoods which close to become a hurricane shutter can be bought and installed permanently.
- Alternatively, the hotel owner may wish to protect the glass (and the contents of the hotel) by installing polyvinyl butryal laminated glass - this

is a preferred option if the cost can be absorbed.

➤ ***EXTERNAL AREAS***

- Flooding often follows a hurricane - check to see high water mark in previous heavy rain storms and ensure that drains are cleared to carry the rain water away from the building and that no storm water can get into the building.

- You should try to dig trenches around the building so as to lead water away from the building especially if the floor is below flood level.

MAINTENANCE AS A MITIGATION TOOL

The hotel building must be in a reasonable condition if it is to withstand the forces of the hurricane. Deferred maintenance is counter-productive as the cost of major renovation becomes inevitable. This is much greater than the annual amounts needed for adequate maintenance of the buildings and plant.

The maintenance of a hotel is a continuous daily operation and is an important ingredient in the delivery of competitive hotel service.

Hotel owners should make every effort to bring the condition of the buildings and plant to the standard where a normal maintenance system can cope with the maintenance requirements.

Maintenance plans must be included in disaster mitigation plans. A well-operated system of maintenance for buildings and equipment is also a very effective disaster mitigation measure in terms of cost and facility usage. It ensures the most economic way to keep the building and equipment in the best of form for normal use, given the original design and materials.

A good maintenance system is a good disaster mitigation system.

If a good system for maintenance is not properly organised, funded, staffed and carried out, then all other disaster mitigation methods could prove insufficient. Experience indicates that roofs, walls, and equipment in general are more vulnerable to failure if normally operated at near breakdown or at any level of technical deficiency. The principal activities to be undertaken for maintaining hurricane resistance (in particular) of the hotel include careful inspection.

Inspect -

- foundations and repair as necessary.
- roofs including claddings and repair as necessary.
- for sign of structural failures and repair immediately.
- electrical installations periodically for sign of wear and loose connections which could lead to malfunctioning and correct immediately.
- external drains and manholes and keep free.
- for termite treatment infestation.
- all building fixtures and fittings ; repair and replace as necessary.
- rainwater disposal systems, and maintain to ensure that water flows freely and discharges away from foundations.
- ground water gradients and maintain to ensure run off away from the building.

Where building components, including fixtures and fittings do not conform to safe and acceptable design standards, these should be modified and improved as necessary.

- ground surface gradients and drainage systems and keep free of dirt and debris.
- piling on wharfs, piers and jetties (timber, steel and concrete) and repair and replace as necessary.
- decks and repair all faults.
- sea walls for signs of structural failure and undermining, and repair as necessary.
- gabions and groynes for signs of instability and correct any defects.

Semi-Annual Reviews

Semi-Annual reviews are performed to the ensure the following :-

- check for implementation of the initial vulnerability audit.

- identify overlooked items.
- benefit from new knowledge.
- identify deterioration.
- review maintenance procedures.

These reviews serve to ensure that an adequate maintenance programme is in place. This in turn ensures a good relationship with the insurance industry and will enable the facility to benefit from more favourable catastrophe-insurance premiums.

All maintenance activities should be systematised and the anticipate-and- prevent approach adopted rather than the react-and-cure approach.

Proper maintenance should ensure that the facility can:

- function at its designed level at all times
- function for the normal life span of the building and of the plant
- resist the effects of extreme natural events such as hurricanes, floods, and earthquakes without damage to its occupants and with minimal repair or rehabilitation necessary after the passing of the event

All maintenance activities should be systematised and the "anticipate-and- prevent approach" adopted rather than the "react-and-cure approach". Repair is often considered to be the main purpose of the maintenance system, rather than the prevention of the need for repair. The scheduled oiling of door hinges and window operators or the painting of exterior wooden members is necessary to prevent failure of the equipment or rotting of the wooden members.

A comprehensive maintenance system should be instituted by hotel managers, and should comprise:

- ❒ organisational structure with clearly defined duties and responsibilities
- ❒ an operation maintenance manual and procedures reference for the buildings and equipment
- ❒ a management information system to produce reports on budget, stocks, inventories of equipment (numbers and condition), staffing requirements (especially for maintenance operations), etc.
- ❒ a preventative maintenance plan for equipment including stand-by equipment and water storage tank
- ❒ a building maintenance plan - including roofs, walls, electricity, water lines.
- ❒ a continuous maintenance training plan for selected maintenance personnel.

Planning of Maintenance Activities

To be effective there must be a detailed list of areas, spaces, materials and equipment to be maintained and a list of defects to be corrected

Maintenance planning activities are normally carried out and should include the development of a detailed annual maintenance budget. The maintenance staff must therefore be trained to examine all parts of the buildings and plant in their care and to record deficiencies. Such lists must be prepared on an annual basis, but this does not preclude the immediate attention to problems which are endemic in many hotels.

Proposed Maintenance Organisation & Staffing

Reporting of work done is also an essential part of the maintenance system. A simple reporting form is included in this report but the hotel manager may wish to devise his own form which may be more responsive to the problems in the hotel. However, the simpler the form the better will be the chances of having the form properly filled out and submitted monthly.

- Hotel assistant manager is responsible to the owner for the efficient

operation of the hotel (including the general staff matters, buildings, equipment and grounds) and for the expenditures authorized in the annual estimates.

- Hotel manager delegates to the maintenance superintendent the responsibility for the maintenance of all buildings and plant and for providing advice to the hotel manager on capital requirements and on the condition of the buildings and plant.

- Technical staff (as required) report to the hotel manager (or maintenance superintendent) including:
  - carpenters
  - plumbers
  - electricians
  - painters

- Gardener and cleaning staff report to the hotel's assistant manager.

- Major repair or renovation projects must be specifically authorized by hotel manager and hotel assistant manager depending on the budget requirements, but normal maintenance and minor repair can be carried out by in-house staff without specific authorization.

Checklists and Frequencies

Three tables are presented covering:

- Table 1.0 - The building interior
- Table 2.0 - The building exterior
- Table 3.0 - The compound

The following abbreviations are used in the tables:

Frequency	Operator
I: Immediately	MS: Maintenance Staff
D: Daily	HM: Hotel Manager
W: Weekly	AM: Assistant Manager
Q: Quarterly	CE: Chief Engineer
A: Annual	

Notes: For *frequency* the maximum period is given. For *operator* the person named is the one responsible for seeing that the operation is carried out.

Table 6.1 Building Interior

Spaces	Frequency	Operator
Washrooms and Toilet		
Inspect and report	D	MS/CE
deficiencies	I	HM/CE
Order replacements	Q	MS/CE
Replace broken	I	MS
elements	A	MS
Repair		
Paint		
Corridors and Guest rooms		
	D	MS
Inspect and report	W	MS
deficiencies	every 2	MS/CE/HM
Clean walls	years	
Repaint walls		
Ceilings, Interior Roofs, Canopies		
	A	MS/CE
Inspect and report		
deficiencies	every 2	MS/CE
Repaint	years	

Kitchen and Technical Areas		
Inspect all counters, floors and walls	D	MS
Report and repair	I	MS/AM/CE
Plumbing		
Inspect and report deficiencies	D	MS/CE
Repair or replace defective pieces	I	MS/CE
Internal Communication System		
Inspect all internal communications to ensure that the system is functioning properly and report defects	Q	AM/CE
Electricity		
Inspect electricity wiring on a room by room basis and report deficiencies.	Q	MS/CE
Furniture		
Repair or replace broken elements	MS/AM	MS

Annual Budget for Maintenance

Hurricane mitigation and planning should be routinely included in budget preparation and planning, as it makes financial sense to build appropriate maintenance, repair and replacement costs into annual budgets.

The maintenance budget should be of the order of **4%** of the current value of the facility per annum and should address :-

- Metal and wood works.
- Equipment which are occasionally used (stand-by equipment) to be regularly tested by its periodic use.
- Repairs leading to moderate improvements.
- Replacements leading to significant improvements (repair versus replacement is an economic issue which should be addressed at this point).
- Regular staff training in the use and operation of equipment.

Maintenance Budget

It is normal for the annual maintenance budget of a hotel with heavy usage to reach

4% of the contemporary capital cost of the building and equipment, assuming that the facilities are in good condition to start with. For hotels, it is estimated that the replacement cost is about US$150,000 per guest room. This figure includes the cost of common and administrative areas but does not include the cost of emergency electricity equipment, water storage or normal furniture and equipment **(ff&e)**.

The maintenance allocation should therefore be no less than **US$6,000 per guest room per year plus an allocation of about 8% of ff&e** for maintenance of those facilities.

For smaller hotels of less than fifty rooms this allocation of **US$ 6,000** per room may be smaller than needed, as the cost of infrastructure maintenance would be proportionately higher than that of a larger hotel.

Proposed Maintenance System

This involves careful review of available data such as drawings, an inspection of the building without invasive testing and a non-mathematical review of existing information on the design and construction of the facility. The consultant engaged to carry out this assessment must be :

- knowledgeable about the effect of hazards on buildings

- be an experienced structural engineer with specific experience in the

Risk Analyses

The hotel owner should determine the level of risk he/she can accept when discussing building or retrofitting plans with the consultant.

Risk is a measure of damage and is a function of the hazard (eg hurricane) and the vulnerability of the subject.

Risk may be measured in **money terms, in percentage-loss terms, in terms of deaths or injured** and using many other criteria. The criterion chosen depends on the aim of the analysis. Insurance companies would want to determine the financial loss whereas a public heath agency may be more interested in the numbers of injured and fatalities. The hotel owner may be interested in the cost of the repair and renovation, and on the number of days of lost revenue that will ensue if the hurricane damages the property.

Risk analyses (before the event) assist decision makers in planning rationally for future hazardous events. The hotel owner should determine the level of risk he/she can accept when discussing building or retrofitting plans with the consultant.

Analytical Evaluation

Buildings deemed not wholesome subject to qualitative assessment would require analytical evaluation. Such an evaluation is time-consuming and expensive. It would be

best if it were carried out when funds are available to implement a retrofitting program.

RETROFITTING

Retrofitting for hurricane resistance can be relatively easy and inexpensive especially if the building is adequately maintained. The determination of a retrofitting program follows the qualitative and analytical evaluations referred to above. Roofs are usually prime targets for retrofitting. Light-weight corrugated roof sheeting is particularly vulnerable because of inadequate fastening systems. Better fasteners are now available, such as the Australian cyclone washer and the French-Caribbean fastening systems for trapezoidal-profile sheeting. Overhanging eaves experience very high uplift loads from the wind. These should be reduced.

Hotel owners may wish to have the conventional glazing in large windows and doors replaced with polyvinyl butryal (PVB) laminated glass, which comes in different thicknesses and with different numbers of laminates to suit different conditions. The building owner may also install shutters that have an everyday function of shading as well as protection of windows in times of storms.

Costs

The costs of retrofitting depend on the conditions of the subject properties. However,

work is now being done on the retrofitting of various facilities and some estimates of costs are available.

An unpublished study now underway on buildings and other infrastructure projects in Jamaica, St. Lucia and St. Thomas showed that for the buildings an additional cost of less than 2 percent of the original construction cost would have prevented the damage by the hurricane, and for the infrastructure projects which suffered much worse than the buildings from the hurricanes, an added expenditure of about 11 percent would have prevented disaster.

Other studies have shown that amounts of from 1 percent to 2.2 percent of increased construction costs were needed for strengthening electricity buildings in Barbados and a hospital in Dominica.

Hotel owners/managers should inform their decisions by these findings.

ROLE OF HOTEL OWNER

Hotel staff should provide support for a comprehensive approach to hazard mitigation. The following are guidelines defining the role of the hotel and its staff in planning to mitigate the impacts to hurricanes, and in so doing, maintain the structural integrity of the buildings throughout the facility. Accountability of staff/consultant is necessary for ensuring the soundness of the plant.

The hotel manager has a significant role to play in the construction and maintenance of

the hotel.

In the first place the hotel owner must:

- Ensure that facilities are designed, built and maintained to function during and immediately after hurricanes, earthquakes, torrential rains and other natural hazards.

- Understand the implications of failure of the building under the hurricane forces.

- Undertake surveys of the vulnerability of the facilities and pursue mitigation actions. Where indicated, it is recommended that the owner engage a review consultant to assist in this task also to carry out twice yearly reviews to:

  - check implementation of retrofitting recommendations
  - identify overlooked items
  - identify deterioration of any part of the system
  - review maintenance procedures and study carefully reports from chief engineer and assistant manager
  - update maintenance procedures and systems where necessary

- Check designs and proposals submitted by the consultants to ensure that the mitigation strategies proposed are satisfactory.

- Appoint a review consultant with thorough knowledge of hotel operations

to assist in the review of the plans.

Construction Records and Plans

All too often the owner cannot find the plans of the hotel. These plans are needed for analysing the structure of he hotel for finding where the buried cables are. The owner must therefore:

- Ensure that as-built drawings are produced for all new construction. (As-built drawings are useful for vulnerability assessments, repairs, additions, alterations and post-damage assessments).

- Document all repairs and replacements.

- Duplicate as-built drawings for "working drawing" sets so that a "mint" as-built set is in the archives at all times.

GUIDELINES FOR CHOICE OF CONSULTANT S

The procedures for the procurement of consultants are very often set by the agency financing the project. The procurement procedures will in most cases require that consultants:

- **be experienced** in the work to be done

- **have a track record** of successful completion of similar projects
- **have the requisite staff** - numbers and qualifications - for the project to be worked on
- **be informed about the natural hazards** that might affect the project and be informed about the techniques for designing for natural hazards **resistance**
- **have the financial ability** to carry out the work required, hire and pay staff and pay the necessary expenses before reimbursement by the owner
- **negotiate fees and expenses** generally on the remuneration schedules of the appropriate professional organisation

The selection will also be based on whether the consultant has:

- **specific experience in retrofitting**
- **local knowledge and presence** -retrofitting of a building to improve resistance to hurricanes is not a project that can be completed properly and fully without time being spent on the site examining the details of construction and determining the critical components to be strengthened
- **professional independence and integrity** are important attributes which cannot be overlooked

The consultant must also understand, and be able to interpret the terms of reference in a manner which will provide the owner with the result desired.The terms of reference should be clear and concise and the owner's or manager's desired result explained to

the consultant.

Selection Procedures

A short list of not more than four consulting firms is required for the selection of a consultant . The short list should be based on knowledge of the consultants who express an interest in the project and who has the ability to carry out the work. The short listed consultants will be required to submit proposals containing:

- past experience of projects of a similar nature
- details of organisation, project control and financial control
- size and responsibilities of staff
- type of organisation and managerial method proposed for the execution of the work
- quality assurance procedures
- knowledge of local conditions and local resources
- technical approach to the project
- availability of resources
- approach and commitment to technology transfer

The owner should assess proposals, negotiate with the selected firm and conclude an agreement. As an alternative to the competitive method outlined the owner may chose to select a consultant based on first-hand knowledge and past relationships. This is often the safest approach.

Briefing of Consultants

The briefing of consultants is an important task which is very often overlooked. The owner must discuss with the consultant specific issues such as:

- the level of risk that the owner is willing to take
- the expected performance of each section of the hotel when impacted by hurricane winds
- the increases in costs attendant upon higher levels of performance
- the schedule for the consultants work
- responsibilities of each key member of the design team to ensure that there are no gaps in the process
- arrangements for the design of non-structural parts such as windows, doors, and balcony railings
- arrangements for receipt of reports on the consultants progress
- arrangements for remuneration of the consultants fees and expenses
- information to be supplied by the consultant on the problems to be solved by the owner and on the time schedule for their solution
- arrangements and procedures for selecting building contractors
- level of inspection of the construction to be supplied by the consultant and attendant cost.

SUMMARY PREVENTION TIPS

The following steps should be taken by the management team to ensure that the hotel can respond to the hurricane hazard without major damage:

- annual inspections of the buildings and plant in March/April

- inspections of the windows, doors, roofs and drainage ditches must be done in April and repairs effected before the hurricane season

- budget estimates for effective maintenance must be based on detailed examination of the buildings and plant supplemented by reports from the users of the buildings and plant i.e. assistant managers and other staff

- chief engineer and the assistant manager must make monthly reports to the hotel assistant manager detailing work carried out, costs, staff available and the problems to be dealt with during the current financial year and those requiring further examination and/or funding

- hotel manager and owner must engage a consultant to carry out vulnerability assessment of the hotel as soon as possible. This activity is one of urgency as it is the forerunner to proper planning of retrofitting and

renovation work which may be needed to prevent the loss of the hotel by a major hurricane

- It is expected that major renovation work which may be necessary will be contracted out and not carried out by the regular maintenance staff.

COMMUNICATIONS PLAN

SECTION V

COMMUNICATIONS PLAN

Crisis Communication Procedures:

How To Deal With The Media

The best way to prepare for a crisis is when there isn't one. Being prepared also means prepared to communicate. When a hurricane strikes you will want the different people to whom you relate to see you as being confident and in control under emergency conditions. This perception will enhance your credibility and establish trust and confidence in your operation.

Special Note!!!

In order to be perceived as being in control, you must be prepared to communicate effectively.

This component of the Hurricane Procedures Manual focuses on one essential aspect of your overall communication needs during a crisis — **Dealing effectively with the media, tour operators, CTO (B'dos, New York, London)**

Some properties may already have their own public relations guidelines, and it is naturally expected that the procedures outlined here will be adapted where necessary to suit individual cases.

A Hurricane event is the first disaster; how reports are carried in the media can be the second! Experience has shown that greater and more-lasting damage to a property or destination can arise from the way in which a disaster is reported in the media. This influences your image in the marketplace which, in turn, determines client decisions and the flow of future business.

Media reports can often result in greater economic fallout to your property than the effects of the disaster itself!!

The Phases of Communication Preparedness

Several activities must be carried out and the necessary measures put in place long before a hurricane has emerged or is anywhere near. These include the following:

1. Conduct a Communications Risk Analysis.

- Identify areas or features of your property which may attract bad press if placed under the media microscope.
- Encourage management to correct the areas in which the property may be vulnerable to bad press.
- Ensure the availability of an up-dated press kit on your property. The kit should include items such as fact sheet, photographs of key personnel, guest and operating policy statements, data such as occupancy levels, and other features of the property, etc.

2. Develop a Crisis Communications Policy.

Your Crisis Communications Policy should include statements such as:

- **Our top priority at all times is to protect human life.** We always attend to the well-being of our guests, our employees, and the general public first and foremost.
- **We will cooperate with the press during a crisis** and we will make special arrangements to ensure that media representatives are treated/served properly.
- **Information** and details of the crisis and of its effects **will be disseminated** as soon as possible.
- The **management will be forthright at all times**, and will not seek to withhold significant facts from the media or from any of its publics.
- The **appointed spokesperson** or deputy will be the only ones authorized to make statements to the media.

3. Designate a room or area in your property which can serve as a CRISIS COMMUNICATIONS CENTRE.

- This centre should have a tracking map, computer with web site linkage if available, television and radio.

4. Appoint a Spokesperson.

- Determine who your spokesperson will be. Such a person must have full knowledge — or access to full knowledge — of the situation, and full authority to decide what and how much to say.
- **He/she must be a senior executive**, familiar with the business and marketing needs of the property, and conversant with its policies. All inquiries should be referred to him/her.
- **Avoid having more than one spokesperson.** This will ensure that what you say — the information you give to the public — remains consistent. However, it may be necessary and practical to assign a deputy; in case of the unavailability of the designated spokesperson.

Make sure that your statements to the media are consistent!

- Accessibility and Availability: the spokesperson should be both available and accessible to the media, and be prepared to give timely responses to enquiries.

5. Brief Your Staff

- As soon as a spokesperson has been appointed, he/she should meet with staff. Staff should be informed that **all enquiries from the media, government agencies, tour operators, CTO/CHA** or members of the public regarding a hurricane event **should be referred to the spokesperson**. Impress on staff the importance of not giving out information other than through this channel. Describe to them the dangers of rumour and unsubstantiated reports, and the damage this can do.

6. Train Key Staff.

- Hold a special training session for staff in certain key positions — **specifically your telephone operators and front desk personnel**. These persons are your front-line to the public, and will have to field a lot of enquiries.
- One recommended response might be: "Let me refer you to Mr. or Ms. X, who will be able to give you up-to-date information on this."

7. Get The Staff On Your Side

- Advise the staff on how work shifts will be managed, and what arrangements there will be for them to secure their homes and families before a hurricane strikes. Even with the "only one spokesperson" rule, staff will talk. You will want them to say that you are a caring establishment.

8. Coordinate Communication Procedures With Your Overseas Representative(s)

In particular, they should be advised of the following:

- Whom should they contact? - Name of in-house spokesperson, contact at CHO B'dos, New York or London
- Who will verify information? - Name of spokesperson
- Who will approve/authorize releases to the media in the market? - Name of spokesperson
- When and how often will situation reports be sent to them?
- If telephones are down, how will communication with the hotel be effected — by Telex? By Radio?

9. Prepare A Press List

- Prepare a list of key local media personnel including weather reporters.
- Prepare a list of key overseas reporters as available from CTO.
- Post on an appropriate notice board a list of relevant web sites.

10. Develop/Update Your Emergency Contact List

- The list should include contact telephone numbers and procedures for members of the Emergency Coordinating Committee, as well as for other key personnel and relevant organisations within the government and elsewhere.

The Hurricane

Phase A - Hurricane ALERT (Storm entering the Caribbean)

This means that a hurricane is in the general vicinity. It may be several hundred miles away, and, while it may appear to be heading towards your area, it may also change course and go elsewhere.

During an Alert, among other things, you should:

- Review or update all points made in the preparedness phase.
- Confirm your contact list of media and CTO persons
- Open dialogue with local media persons and National Disaster Coordinators

Phase B - Hurricane WATCH (36 Hours)

At this stage, a hurricane is now about thirty-six hours away and headed in your direction -- it may still, however, dissipate or go elsewhere.

During a Watch, among other things, you should:

- Continue preparatory activities as for the Alert.
- Holding a Guest Information Session whereby guests are able to ask questions and have them answered.

Phase C - Hurricane WARNING (24 Hours)

This means that the hurricane is expected to strike your area in about twenty-four hours.

During a Warning, among other things, you should:

- Conduct dry runs of all crisis communications procedures.
- Begin preparation of news bulletin or statements for dissemination to media and other relevant agencies as listed. These would include information on steps being taken to minimize personal injury and to manage the effects of the hurricane.

During The Hurricane

- The safety of everyone is the principal concern here. However, public relations or Crisis Communications Personnel should be particularly sensitive and alert to the likely emergence of symptoms of **CRISIS STRESS** among guests as well as among hotel personnel. In other words, be alert to the human factor.
- Ensure that the log is being maintained. This will assist you greatly when you start preparing releases subsequently.

After the Hurricane

After the hurricane, all hands will be fully engaged carrying out various requirements for conducting **DAMAGE ASSESSMENT, CLEAN-UP, SALVAGE, and BUSINESS RESTORATION**. This is also the time when the public relations or Communications Team will be the busiest.

Before you thought it possible, representatives of both the local and the international media will be upon you.

Brief your overseas public relations people as soon as possible – that is, immediately after a preliminary assessment of the situation has been ascertained.

Be ***pro-active***. Don't wait to be called. Develop a simple statement to release to the local press indicating the status of your guests and property. Transmit its contents as soon as possible to your overseas public relations people, bearing in mind that whatever is published or aired locally will inevitably be picked up overseas.

Afterwards, provide a more detailed statement which should include:

- A general account of any damage sustained.
- How you are coping.

Recommended Protocol For Handling The Media

When dealing with the media people, your spokesman should:

- **Never lie to the press.**
- **Provide full and accurate information.** If you don't have all the information, or if you need to delay or verify, make specific arrangements for any follow-up contact necessary – and **keep your word.**

Conclusion

It is important to note here that guests, returning home from a hurricane-hit destination, will be targeted by the press in their hometowns for comments and interviews. It will be a good idea for hotels to arrange, in conjunction with their Tourist Board's sales representative and overseas public relations personnel, follow-up contact with returnees, including perhaps, a letter from the hotel manager, or Tourism Director, or Minister. Returning tour groups might be greeted at planeside.

- In short, everything should be done to ensure and retain guest's goodwill after a hurricane and to reinforce the feeling that you really care.
- Prompt communication with local organisations (National Disaster Committee, Tourist Board etc.) and with CTO communication network will help to get the correct news out and to minimize negative fallout.

SECTION VI

MANAGING YOUR INSURANCE COVERAGE

MANAGING YOUR INSURANCE COVERAGE

When a disaster strikes, specialist insurance adjuster are sent in to the affected territory

BEFORE A HURRICANE STRIKES
IS THE TIME TO PREPARE!

to evaluate losses and claims. You must ensure that you have the coverage you need.

Insurance Coverage Considerations

- Ensure that **description of premises** is correct (e.g. number of rooms, number of floors, boundary lines, etc)
- Be certain that **property values are realistic** in order to avoid coinsurance penalty if you have a big loss. Coinsurance requires that you, the insured, pay a portion of the loss.
- Be certain that you **cover all you intend to cover**, i.e. , in addition to structures, remember pots and pans, artwork, signs, fences, trees, shrubbery (inside and outside), tennis courts, swimming pools, awning, seawalls, piers, docks, etc. Policy descriptions should be as broad as possible.

TIP!!!

For computers, list all hardware and software.

Also consider Boiler and Machinery Coverage (if applicable).

- Ensure that the policy includes coverage for **debris removal and flooding**, and confirm in writing.
- Consider coverage for **loss of utility service** due to off-premises equipment failure (light, telephone, water).
- **Business Interruption** (loss of earnings) insurance is important coverage, but the policy must be carefully executed. Complete a business interruption worksheet with your insurance agent or broker to determine value to be insured. State exact period (e.g, three months, six months, twelve months) for which loss of earnings coverage is required. Cover those costs needed during the restoration phase, such as payroll, trucking or purchasing water, transportation, and other unbudgeted or extra expenses. Business interruption coverage normally ends **thirty (30) days after** physical damage has been **repaired unless endorsement** states otherwise. It is more realistic to include additional time, because business to hotels is not usually restored immediately following repairs.

Special note:

Beaches and land are ***not insurable***, nor is loss of market, but damage to these will affect business.

Consider these factors when you are negotiating interruption policies.

- All policies have a **"due diligence"** clause which means that in order to claim for business interruption, you must do everything possible to get back in business as quickly as possible..
- In order for the business interruption clause to apply, you **must** have **direct physical damage** to the plant, unless the policy carries an **endorsement** to cover interruption due to factors off-premises.

IMPORTANT!!!

Keep insurance policy in a safe place, but readily available.

- Determine **LIABILITY LEVELS** and ascertain whether you need local or international jurisdiction clauses. If you have **no property** or **financial exposure**

in the United States/Canada, you may opt for local jurisdiction. If however, you have such property or exposure, you must take international jurisdiction. A suit can be brought against you, and your policy can only stand if it has international jurisdiction.

- Keep records in a safe place, and have readily available the name, and telephone numbers of the insurance agent, broker, and company. Find out from the broker the name and location of the person to be contacted when there is a claim.
- If you have any questions concerning coverage, contact your agent, broker, or company and get a **WRITTEN REPLY.**
- **PICTURES ARE WORTH A THOUSAND WORDS!** In case of a major loss, take photographs; if possible, take a video recording as well.

IMPORTANT!!

Insure only with a
reputable, secure company.

- In preparation of your claim, work closely with the accountant to ensure that all items are included. Present as much information as possible.
- Maintain close interaction with your agent or broker.

SUGGESTION!!!

Develop a "comfort level" with the adjustor and be ***pro-active*** — get your insurance company fully involved with your claim.

ALWAYS DEMAND FULL-QUALITY SERVICE.

Example of " Description of Premises" Wording

Description and Location of the Property Covered:

On all real and personal property of every kind and description including any kind of signs and fences, including Paths, Roads, Foundations, Seawalls, Docks and Piers, Tress and Shrubbery (Inside and Outside), Landscaping including Palm Trees, Tennis Courts and Swimming Pools, whether loaned, leased, owned and/or controlled by, or in which the insured may have insurable interest or be liable for, and which is used in the operations of the insured, and their various facilities, including property in trust or on commission or which they may have attached as creditors, all while located at: (Name and Physical Address of your Hotel).

(Courtesy of : Joseph Murray, The Murray Group, Hato Rey, Puerto Rico)

FORMS

SECTION VII

FORMS

FORMS

1A: BUILDING ASSESSMENT SAFETY CHECKLIST

1B: BUILDING ASSESSMENT VULNERABILITY RECORD

2: HURRICANE SUPPLIES INVENTORY

3: HURRICANE SUPPLIES INVENTORY-EMERGENCY SUPPLIES

4: HURRICANE PROCEDURES FOR GUESTS

5A: DAMAGE ASSESSMENT REPORT A

5B: DAMAGE ASSESSMENT REPORT B

6: MUTUAL AID AGREEMENTS

7: PROPOSED MONTHLY REPORT FORM

CHA/CTO BUILDING ASSESSMENT
SAFETY CHECKLIST
(FORM 1A)

_____

_____

_____

(Where a problem-condition exists, fill out details on FORM 1B)

OFFICER:

BUILDING:

DATE:

When a problem-condition exists, describe on FORM B.

CHECK IF PROBLEM:

FIRE EXTINGUISHER

_____ 1. Reading shows low pressure, discharged, or damaged.

_____ 2. Type not labeled.

_____ 3. Not accessible.

_____ 4. Missing.

_____ 5.

_____ 6.

FIRE EXISTS AND CORRIDORS

_____ 7. Blocked.

_____ 8. Signs not visible.

_____ 9. Warped or sticking doors.

_____ 10. Locked doors.

_____ 11.

_____ 12.

SMOKE AND WATER DETECTORS

_____ 13. Inoperative.

_____ 14. Weak battery.

_____ 15. Fire hoses inaccessible or blocked.

_____ 16.

ELECTRICAL EQUIPMENT

_____ 17. Worn or exposed wiring

_____ 18. Electrical equipment not grounded.

_____ 19. Open light sockets.

_____ 20. Burned out lights

_____ 21. Defective equipment not tagged, "Do Not Use."

_____ 22. Circuit boxes "Hot" to the touch.

_____ 23. Overloaded sockets.

_____ 24. Heavy grease buildup.

_____ 25.

_____ 26.

HAZARDOUS MATERIALS

_____ 27. Missing identifications labels.

_____ 28. Improper storage.

_____ 29. Storage location.

NON STRUCTURAL IMPACT DANGER

_____ 30. Unstable furniture.

_____ 31. Books or boxes dangerously piled.

_____ 32. Bookshelves and other shelving units on wall are unanchored at floor or

ceiling.

_____ 33. Other unsecured appliances.

_____ 34. Heavy hanging objects over doors, above windows, etc.

_____ 35. Windows with weak latches.

_____ 36. Breakables, or other heavy objects on high or open shelves.

TRIPPING AND OTHER IMPACT DANGER

_____ 37. Electrical cords in dangerous position.

_____ 38. Floor tiles need replacement.

_____ 39. Steps, carpeting, worn or frayed.

OTHER

_____ 40. Insufficient emergency lighting.

_____ 41. Water pipes leaking.

_____ 42. Chipped or broken glass

_____ 43. No First-Aid Kit.

_____ 44. First-Aid Kit supplies insufficient.

_____ 45. In-house emergency supplies.

_____ 46. Trees require trimming.

SECURITY

_____ 47. Security or perimeter fence broken.

_____ 48. Unattended critical areas unlocked or improperly secured.

CHA/CTO BUILDING ASSESSMENT

VULNERABILITY RECORD

FORM 1B

NUMBER (from Form 1A)	PROPERTY LOCATION	DETAIL

FORM 2

HURRICANE SUPPLIES INVENTORY

QUANTITY	ITEMS	STATUS
_____	Bull Horn	_____
_____	Chain Saws	_____
_____	Rain Cloaks	_____
_____	All-Purpose Gloves	_____
_____	Rubber Gloves	_____
_____	Suction Machine	_____
_____	Ropes 3/4"	_____
_____	Ropes 1/2"	_____
_____	Masking Tape	_____
_____	Camera	_____
_____	Film	_____
_____	Batteries	_____
_____	Flashlights	_____
_____	Flashlight Bulbs	_____
_____	Battery Lanterns	_____
_____	Battery Operated Radio	_____
_____	Saws	_____
_____	Hammers	_____
_____	Nails	_____
_____	Wide Brooms	_____

HURRICANE SUPPLIES INVENTORY

QUANTITY	ITEMS	STATUS
_____	Large Mops/Sticks	_____
_____	Wringer Pails	_____
_____	Shovels	_____
_____	Crocus Bags	_____
_____	Load of Sand	_____
_____	Water Boots	_____
_____	Water Scrapers	_____
_____	Plastic Buckets	_____
_____	Plastic Sheeting	_____
_____	Ply Board	_____
_____	Lumber	_____
_____	Generator	_____
_____	Helmets	_____

HURRICANE SUPPLIES INVENTORY

_____ 7-Day's Gas, Diesel Oil (Minimum) _____

_____ 7-Day's Potable Water _____

_____ Disposable Sanitary Ware _____

_____ Forks/Knives/ Spoons _____

_____ Cups _____

HURRICANE SUPPLIES INVENTORY

QUANTITY	ITEMS	STATUS
_____	Plates	_____
_____	Napkins	_____
_____	Garbage Bags	_____
_____	Charcoal	_____
_____	Chlorinating Tablets	_____
_____	Guy Wire (To secure critical areas post-hurricane)	_____
_____	Duct Tape	_____

HURRICANE SUPPLIES INVENTORY

FOOD SUPPLIES

QUANTITY	ITEMS	STATUS
_____	Tinned Protein	_____
_____	Ham	_____
_____	Sardines	_____
_____	Tuna	_____
_____	Salmon	_____
_____	Crackers	_____
_____	Biscuits	_____
_____	Canned Sodas	_____
_____	Canned Fruit Drinks	
	_____	
_____	Bottled Water	_____
_____	Powered Milk	_____
_____	Coffee	_____

_____ Tea _____

_____ Corned Beef _____

_____ Sausages _____

_____ Tinned Vegetables _____

FORM 3

HURRICANE SUPPLIES INVENTORY

EMERGENCY SUPPLIES

QUANTITY	ITEMS	STATUS
_____	Crepe Bandages	_____
_____	Antacids	_____
_____	Mercurochrome	_____
_____	Sterile Gauze Squares	_____
_____	Eye Wash	_____
_____	Eye Drops	_____
_____	Painkillers (e.g.Panadol)	_____
_____	Sanitary Napkins	_____
_____	Baby's Pampers	_____
_____	Tampons	_____
_____	Safety Pins	_____
_____	Thermometers	_____

_____ Calamine Lotion _____

_____ Antiseptic _____

_____ Tweezers _____

_____ Rubbing Alcohol _____

_____ Scissors _____

_____ Plastic Bags _____

FORM 4

HURRICANE PROCEDURES FOR GUESTS

Welcome to (Name of Hotel).

Your have chosen one of the most beautiful places on earth to spend your holiday. We have calm, beautiful seas, lovely beaches, and sunny skies; most of the time.

But as you know, during some months of the year, usually between July and September, hurricanes can occur in this part of the world.

We have taken every precaution to ensure your safety, should a hurricane occur while you are here. Knowing what to do is one of the most important precautions YOU can take.

Please take a few minutes and read this brochure carefully. Then relax and enjoy all the good things we have to offer.

WHAT IS A HURRICANE?

Let's begin with things you should know about a hurricane itself. A hurricane is an intense storm with winds of over 75 miles per hour. It is usually accompanied by heavy rain, and sometimes high seas. It should be treated with respect.

When a hurricane is in the area, there are three phases in which it is brought to our attention. These are:

HURRICANE PROCEDURES FOR GUESTS

Phase A — Hurricane Alert : This means that a hurricane is in the general vicinity and, though it may be several hundred miles away, appears to be heading towards us. During this Phase, it may change course and go somewhere else.

- ***What to do in a Hurricane Alert:*** You will be advised what to do by our _____ when a Hurricane Alert is announced. You may contact the Front Desk for updates on the situation.

Phase B — Hurricane Watch: A Hurricane Watch is announced when a hurricane is about 36 hours or so away.

- ***What to do during a Hurricane Watch:*** You will be advised by our _____ as soon as the Hurricane Watch is announced. At this time, you should read this brochure again and make sure that, if you are traveling with your family, everyone is fully briefed. It is advisable to check now and then with the Front Desk/Hurricane Information Desk for the latest information. Also, ensure that your home address, telephone numbers, and contacts are on file at the front desk (if these were not recorded when you registered).

Phase C — Hurricane Warning: A Hurricane Warning is announced when a hurricane is expected to strike our location in 24 hours.

- **What to do when a Hurricane Warning is announced:** You will be advised of a Hurricane Warning through our Public Address System, or our Telephone Operator, or by members of the Staff.

As soon as a Hurricane Warning is confirmed, you should:

1. Secure your passport, or other travel documents, in the hotel safe, along with any other important papers you may have with you. You must also make sure to put money, jewelry, and other valuables, in the hotel safe. Please note that the Hotel

cannot be held liable for valuables not deposited in its safe.

2. You may find it convenient to settle your bill at this time; it will make it much simpler and easier for you later, in case there are any disruption after the hurricane.

3. Pack a small bag with essential personal items such as medication, towels, contact lenses, toilet articles, and one change of clothing. If you have small children with you, remember to pack baby food, diapers, etc., and a change of clothing for each child.

4 Pack away all your clothes and non-essential personal items in your suitcases, and put the suitcases in plastic garbage bags-the housekeeper till supply these for you. Seal the plastic bags with masking tape provided, and then put them in the cupboard in your room. Lock your room and take the key with you.

5. Go to the designated Hurricane Shelter as soon as you are told to do so. The Hurricane Shelter in this Hotel is located here (diagram of description). Remain in the shelter, and at all times stay away from glass windows and doors. Do not go out until you are told to do so. (Described evacuation procedure if Hurricane Shelter is not on the property).

6. Our Trained staff members will be assigned to help you find the Shelter and manage safely during the hurricane. You should follow their instructions.

7. Our Hotel is equipped with a number of emergency features. These include:

   a) Emergency power supply, sufficient to light hallways, designated elevators, the Hurricane Shelter, etc. as applies.

   b) Other, e.g. Radio Communications.

8. A first-Aid Centre will be set up adjacent to the Hurricane Shelter. It is located here (diagram, if possible). A trained nurse/doctor (?) will be in attendance.

9. An Emergency Telephone Number will be activated when a Hurricane is announced. Our Hurricane Emergency Number is (?).

10. Our Front Desk/Hurricane Information Desk will help you with arrangements to contact your family and friends before and after the hurricane.

11. For your safety, alcoholic beverages will not be served while a Hurricane Warning is in force, and until the hurricane has passed over.

12. Stay calm. Hurricanes give us a fair amount of warning. If you follow these simple steps, and whatever other instructions you are given by our staff, you will be fine.

HURRICANE PROCEDURES FOR GUESTS

(Suggested wording for prototype brochure--to be adjusted according to specifics of individual property)

FORM 5A

DAMAGE ASSESSMENT REPORT (A)

Information reported for (check one or more and list appropriate names):

_____ Location:_____

_____ Unit/Floor#Room#_____

_____ Owner/Occupier of Condominium_____

Area of Property /Unit/Floor	Function	Description of Damage	Primary Damage(P) or Secondary Damage (S)	Total Estimated $ Loss	Estimated Uninsured $ Loss
		Internal Equipment:			

DAMAGE ASSESSMENT REPORT (A)

Area of Property /Unit/Floor	Function	Description of Damage	Primary Damage(P) or Secondary Damage (S)	Total Estimated $ Loss	Estimated Uninsured $ Loss
		Supplies:			
		Electrical Installation:			
		Other:			

FORM 5B

DAMAGE ASSESSMENT REPORT (B)

Information reported for(check one or more and list appropriate names):

_____ Location:_____

_____ Unit/Floor#Room#_____

_____ Owner/Occupier of Condominium:_____

Area of Property Unit/Floor	Function	Description of Damage	Primary Damage (P) or Secondary Damage (S)	Total Estimated $ Loss	Estimated Uninsured $Loss
		General			

DAMAGE ASSESSMENT REPORT (B)

Area of Property Unit/Floor	Function	Description of Damage	Primary Damage (P) or Secondary Damage (S)	Total Estimated $ Loss	Estimated Uninsured $Loss
		External Roof:			
		Windows:			
		Walls:			
		Miscellaneous:			

FORM 6

MUTUAL AID AGREEMENTS

ELEMENT	COMPANY/HOTEL	CONTACT PERSON AND TELEPHONE #	STATUS	DATE
Fuel				
Water				
Transportation				
Alternative Room				
Storage Space				
Generator Capacity (Ice, Food, etc.)				

ELEMENT	COMPANY/HOTEL	CONTACT PERSON AND TELEPHONE #	STATUS	DATE
Computer Processing Facilities				
Communication System				
Off-Site Storage for Vital Records				
Manpower for Cleanup and Salvage				

FORM 7

PROPOSED MONTHLY REPORT FORM

To: Hotel Manager/Assistant Manager

Report of the Maintenance Division for the month of:_____

Submitted by:_____ Date: _____

Trade	Area or Room	Work done	Material cost	Labour cost	Remarks
Carpentry Doors Windows Roof Floors					
Masonry					
Electricity					
Plumbing					

Painting					
Other trades					

APPENDICES

APPENDICES

Appendix

Damaging Post-Columbian Hurricanes in the Caribbean (Since 1492)

Country	Number of known significant events since 1492	Country	Number of known significant events since 1492
Anguilla	9	Haiti	30
Antigua/Barbuda	44	Jamaica	65
Bahamas	72	Martinique	41
Barbados	52	Montserrat	13
Belize	27	Puerto Rico	94
Bermuda	44	St. Eustatius	16
Virgin Islands	31	St. Kitts/Nevis	104
Cayman Islands	17	St. Lucia	16
Cuba	150	Saint Marten and Saba	14
Dominica	43	St. Vincent	9
Dominican Republic	62	Tobago	8
Grenada	10	Trinidad	14
Guadeloupe	49	Turks and Caicos	13

Appendix II

Caribbean Disaster Mitigation Project (CDMP)

The CDMP is a coordinated effort to promote the adoption of natural disaster mitigation and preparedness practices by both the public and private sectors in the Caribbean region through a series of activities carried out over a five-year period. The CDMP is funded by the USAID office of Foreign Disaster Assistance (OFDA) and implemented by the Organization of American States/Unit of Sustainable Development and Environment (OAS/USDE) for the USAID Caribbean Regional Programme (USAID/CRP).

The CDMP provides a framework for collaboration with the Caribbean region to establish sustainable public sector mechanisms for natural disaster mitigation that will measurably lessen loss of life, reduce the potential for physical and economic damage, and shorten the disaster recovery period over the long run. Project activities vary according to location, contents and implementation strategy, but all contribute to attainment of overall CDMP goal: a more disaster-resistant environment for the people who live, work and invest in this hazard-prone region.

Project activities include:

- natural hazard risk audits for electrical utilities and other infrastructure systems and key lifeline facilities;
- hazard mapping to support improved planning and location of physical development;
- promotion of loss reduction incentives and hazard mitigation in the property insurance industry;
- assisting countries to adopt improved building standards and practices and training of builders, architects and artisans in their use;
- stimulating community-based disaster and preparedness and mitigation efforts with support of the private sector, and
- post disaster mitigation planning and program design.

The CDMP will build on past and ongoing regional initiatives in disaster preparedness and mitigation, and will promote technology transfer and institutional capacity building through direct involvement of professional associations, bankers, insurance companies and reinsurers, PVOs, NGOs, community groups and government organizations in project activities.

HURRICANE TRACKING MAP

This document is a supplement to the

CHA/CTO Hurricane Procedures Manual

for the Caribbean Hotel Sector

Presented by

The Caribbean Hotel Association and
The Caribbean Tourism Organization

Supported by

The International Hotel Assocation
and American Express
Travel Related Services, Inc.

Hurricane Tracking Map Provided by

Cayman Free Press

Tune into your radio or TV for the latest storm advisories from the weather bureau. Register the storm's position, date and time in storm data block below. Read latitudes from base to top, longitudes from right to left. Pinpoint storm on chart according to given latitude and longitude. Draw small circle around point and register corresponding number as registered in storm data block. As storm proceeds, tie points together.
To measure distance, use graphic scale at bottom left of chart.

No.	Latitude, Longitude Position	Date	Time	Velocity M.P.H.	Movement M.P.H.	Direction	Miles From Your City
15							
14							
13							
12							
11							
10							
9							
8							
7							
6							
5							
4							
3							
2							
1							

Register Storm Data Above as Received Via Radio Broadcasts

CANADA
UNITED STATES
MEXICO
GULF OF MEXICO
PACIFIC OCEAN
CUBA
JAMAICA
HONDURAS
GUATEMALA
BELIZE
NICARAGUA
COSTA RICA
COLOMBIA
VENEZUELA
BERMUDA
GRAND CAYMAN
CAYMAN BRAC
LITTLE CAYMAN

MILEAGE SCALE 0 100 200 300 400 500